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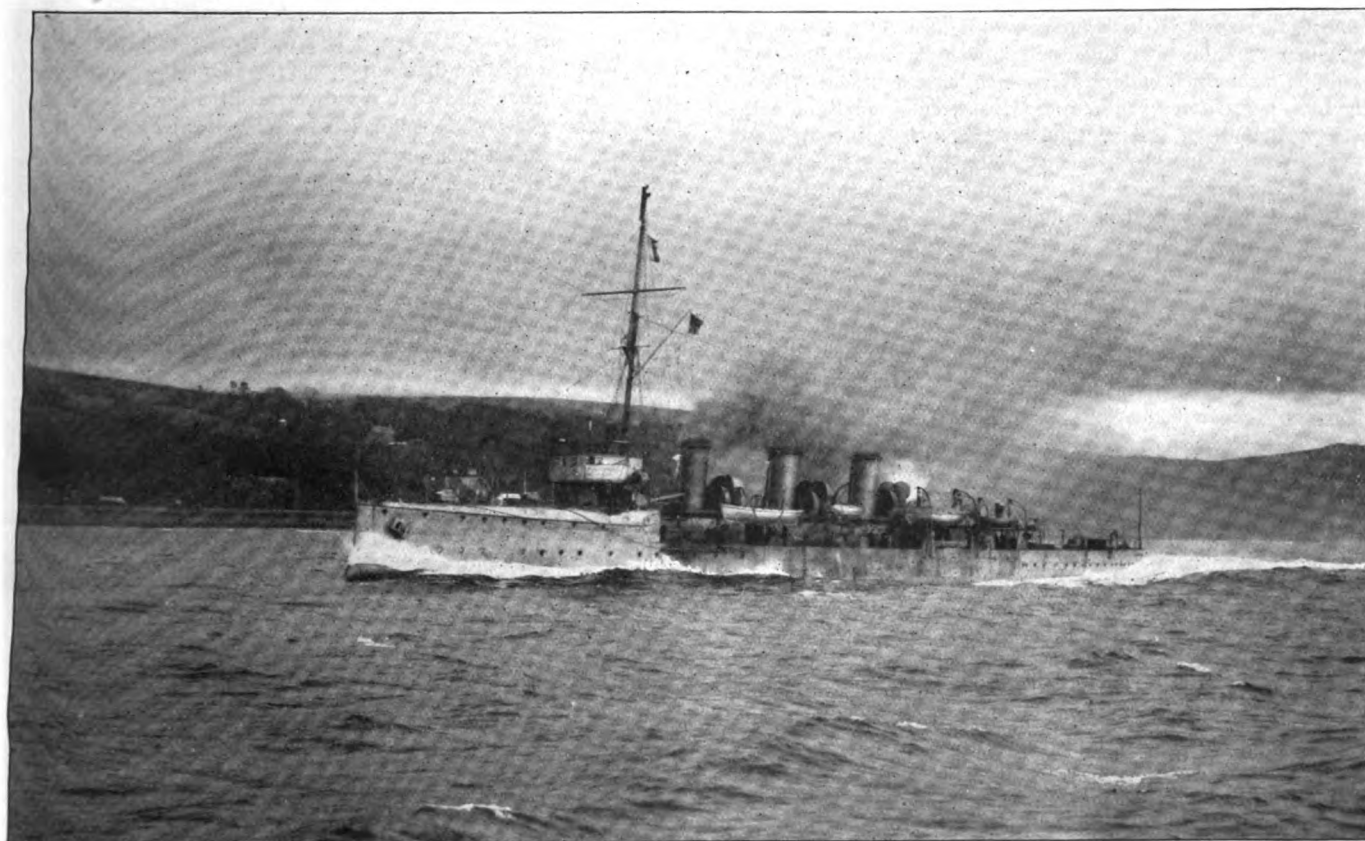
CLEVELAND, O., APRIL 27, 1905.

No. 17.

#### TRIAL TRIP OF THE SENTINEL

The trials of the first of a new class of warship are always interesting, and those of the Sentinel, designed, built, engined, and armed by Vickers, Sons & Maxim (Limited), and the first of the new scouts built for the British navy, are especially so to the American navy, principally because of the severe

battleship the units of power of the engines, as a rule, are about equal to tons of displacement; in cruisers the ratio is seldom more than  $1\frac{3}{4}$  I. H. P. to 1 ton; but in the scouts, typified by the Sentinel, the power is equal to  $5\frac{3}{4}$  I. H. P. per ton, even including in the tonnage all the coal, ammunition, and stores for war service, so that it will be realized that the maintenance



BRITISH SCOUT CRUISER SENTINEL.

conditions set down in the contract, and to the fact that the United States navy department is about to build three scout cruisers. In fact, it can be said that no ship has had to undergo a more searching test than that involved by the eight hours' trial at full speed. It is true that a run of similar duration is prescribed for battleships and cruisers, but in their case there is not the same limitation in regard to weight. In a

of such a high speed as 25 knots at sea for eight hours is a particularly severe condition. This speed, however, was easily exceeded on the splendid performance of Friday, the actual average rate being  $25\frac{1}{4}$  knots, which has never before been reached by any vessel larger than torpedo craft; and, moreover, it was attained without any alteration either in the trim of the ship, in the form or pitch of the propeller, or in the machinery

arranged for in the design. I have had opportunity of examining the curves of power and speed prepared when the vessel was designed in comparison with the results now achieved, and I have seldom seen so close a realization of anticipations.

These scouts, of which eight are being built, are, as indicated, new to the service, and are destined to prove most valuable in war time. It is recognized that a fighting fleet, must surround itself with a screen of fast cruisers, in order to give warning of the approach of the enemy's squadron and to conduct reconnaissance work. The more of such cruisers there are the more effective will be the knowledge possessed by the admiral, but there is a limit to the number of armored cruisers which any nation can afford, and therefore to the radius of such screen. The new scouts will, therefore, form what might be termed a very wide fringe to a screen of armored cruisers, since four may be built for practically the same cost as one modern armored cruiser. The scouts cannot conduct reconnaissance in force; the aim will rather be to give warning of the approach or position of the enemy, leaving the piercing of the enemy's screen to the armored cruisers, which can ultimately be concentrated for such purpose. As the scouts are not intended to combat the armored cruisers of the enemy, it was decided to limit their power of attack to such guns as would defeat torpedo-boat destroyers engaged, for instance, on scouting duty by the enemy. Consequently, the scouts are armed with ten 12-pounder and eight 3-pounder guns, and have two tubes on deck for firing the larger size on torpedoes. A destroyer could not, therefore, stand up against such a ship, and the scouts will always have speed to run away from a formidable enemy.

Speed, therefore, is the primary requirement in these craft, and when 25 knots was suggested it was arranged that this should be maintained under adverse weather conditions. This, therefore, necessitated ships of good sea-keeping qualities, and the performance of the *Sentinel* on her series of trials has proved that this ship meets this as well as other essential conditions. The *Sentinel* is a vessel of 340 feet in length, of 2,920 tons displacement; she has a high forecastle, to meet heavy seas, but otherwise lies low in the water, so that she will not be seen from the deck of the enemy's ship beyond eight miles radius. At the same time she has a very high bridge, higher almost than the three funnels, so that a good lookout may be kept. She is well divided by bulkheads, and the scantlings are much heavier than is usual in such high speed craft.

The trials prescribed by the admiralty were that the vessel should steam for 96 hours at cruising speed, and that the rate of coal consumption on the latter half of this run should determine the quantity of fuel to be carried when the vessel was running at full speed to enable her to travel 1,500 miles. With this allowance of coal and a load equivalent to the prescribed weight of ammunition, etc., the vessel was required to steam for eight hours at 25 knots speed. At the beginning of this trial the vessel had to steam six times over the measured mile within a period of one hour and a half, and the average revolutions per minute made by the machinery during this time had to be maintained for the remainder of the eight hours. This insured that the speed throughout the whole of the eight hours would be 25 knots. The builders, the Vickers Company, however, decided to adopt their usual practice in the case of all the ships of the new class constructed by them, i.e., the carrying out of a long series of experimental trials for the accumulation of the data which enable them in successive ships to excel previous achievements, and to these experimental trials brief reference may be made. They included extended runs at various speeds from 10 knots up to 25 knots. As a measure of the cost of high power, it may be said that to increase the speed from 22½ knots to 25 knots involved the doubling of the power required for the former speed. Again, the last knot, that is to say, the advance from 24 to 25 knots, involved a quarter of the maximum power. The same pro-

portion of power is sufficient to drive the vessel at 19 knots. These private trials over, the ship proceeded on her first official test—a 96-hours' continuous run at a cruising speed of 10 to 12 knots. This was carried out under very severe weather conditions, a gale blowing for three-fourths of the time, so that the vessel was well tested so far as weather conditions were concerned, and the naval officers in charge spoke well of her behavior. The most important point of the trial had reference to the coal endurance, and it was found that the consumption per knot was practically 2 cwt. One ton was sufficient to carry the ship for 11 sea miles. This, as indicated already, determined the load of coal which had to be carried on the full power trial.

After a preliminary run earlier in the week, when good results were realized, the vessel started on the crucial full-speed test. Two preliminary runs were made over the measured mile, and everything being in order, the official trial began at 9:40. The first procedure was to make six runs over the measured mile at Skelmorlie. The first and second runs were made at low water with a slack tide, and it is suggestive alike of the precision with which the results were taken, and of the regular working of the engines, that the difference in time between the two runs was only 6-10ths of a second. On the subsequent runs tidal influence came in, but the third and fifth runs, which were made against the tide, only differed in time by 4-10ths of a second, while the two runs with the tide were made in exactly the same time, viz., 2 min. 24.4 sec. This meant practically no variation in engine revolutions, the mean power being about 17,500, while the mean of mean speeds was 25¼ knots, which is nearly equal to 30 land miles per hour. When it is remembered that the load thus propelled is more than nine times the average weight of a train making about the same speed on rails, the significance of the performance will be appreciated. In conformity with the contract, the vessel then proceeded down the firth, the engines maintaining for a further 6½ hours the same number of revolutions.

During the course of the run interesting evidence was afforded of the advance in naval architecture in 40 years by the passing two or three times of the yacht of the Khedive of Egypt, which was coming up the Clyde. This old ship, with her high freeboard and immense paddle wheels, going at a very slow speed, offered a striking contrast to the *Sentinel*. The new scout also steamed round one of the armored cruisers of 16 years ago under tow of one of the "County" class of cruisers proceeding to the Holy Loch, where she will lie as an obsolete ship until sold. This cruiser of 16 years' standing cost only about 25 per cent. more than the modern vessel, but she has a displacement tonnage of three times that of the *Sentinel*. In her case the proportion of power to tonnage is barely one to one, while, as we have already said, the *Sentinel* has 53¼ horse power per ton, and from other points of view has very much greater potentialities for success in naval fighting. The *Sentinel* concluded her full-power trial at 20 minutes to six, and proceeded to the tail of the bank, having been run at over 25 knots for practically 10 hours. On the way to Barrow she carried our manœuvring trials. She has shown fine qualities from the point of view of naval architecture, as well as of engineering. At all speeds there was a complete absence of vibration; even at full power it was easy to write on the table in the commander's room, situated immediately over the propellers. She will now be completed for commission. When in service special interest will be taken in these vessels, because they are the only warships in the navy larger than destroyers which have been designed by private firms, excepting only the *Swiftsure* and *Triumph*, built respectively by the Armstrong and Vickers companies. The admiralty laid down certain conditions to the various firms, and invited designs from them. The firms whose designs were accepted are, of course, those

who built the ships—two each by Cammel, Laird & Co., Birkenhead, the Fairfield company, Sir Wm. G. Armstrong, Whitworth & Co., and Vickers, Sons & Maxim.

### PLANS FOR NEW REVENUE CUTTER

Washington, April 26.—With the co-operation of line and engineer officers work has just been started at the headquarters of the United States revenue cutter service upon the preparation of plans for Revenue Cutter No. 15, a vessel (as yet unnamed) designed for service in the North Carolina district with headquarters at Newbern, N. C., and which constitutes the only new construction now authorized for the revenue cutter service. Especial interest attaches to the plans for this new craft by reason of the fact that she will be wholly unlike any other vessel in the fleet. Her chief distinctive feature will be found in shallow draught, made necessary by the unique character of the waters in which she will ply. It has been determined that the specifications must not call for draught exceeding 6 ft. and the limit may be placed as low as  $4\frac{1}{2}$  ft., according to the final judgment of the designers who are now investigating this phase of the subject.

The new vessel which will, of course, be of steel construction, will be from 160 to 180 ft. in length and from 30 to 36 ft. in beam, the exact dimensions to be determined by the draught finally decided upon. Aside from the problem of draught, however, the officials of the service are wholly undecided whether to build a side-wheel vessel with independent engines or a twin-screw ship with triple-expansion engines. The adoption of the latter type would permit the new cutter to be used elsewhere than in the district for which she is to be built, but it is something of a question whether it would ever be desired to make such transfer since there is no other cutter in the fleet which can operate in the North Carolina district satisfactorily.

Repair work in the revenue cutter fleet will of necessity be kept down to urgent requirements during the coming year owing to the limited appropriation available, but congress allowed a special item of \$30,000 for the repair of the wooden revenue cutter Thetis now at San Francisco and the preparation of specifications for this work is now in progress. Repairs are to be made to both hull and machinery and estimates will be asked from all ship builders on the Pacific coast.

An interesting and significant feature of the prospective work on the Thetis is found, however, in the fact that the board of officers having the work in charge has been asked to prepare specifications with a view to having the repair work done at a United States navy yard if desired, it being the desire of the revenue cutter officials to follow in the footsteps of their brethren of the navy in seeking information as to the relative cost of new construction and repair work in private plants and government yards, respectively.

### NEW POTOMAC RIVER STEAMER

Washington, April 26.—The Norfolk & Washington Steamboat Co., operating a line of passenger and freight steamers on the Potomac river and Chesapeake bay, has practically closed a contract with the Newport News Ship Building & Dry Dock Co. for a new side-wheel steamer to be delivered in the summer of 1906. The tentative plans call for a vessel 250 ft. in length, 35 ft. beam on the water line and 50 ft. beam on deck. She will be fitted with inclined compound engine of power sufficient to give her a speed of 18 to 20 miles per hour. This type of engine removes the necessity for a large center house on deck and makes it possible to provide a particularly commodious saloon and main deck. The new vessel is designed for day service exclusively and in consequence will have no staterooms, but opening from the saloon will be eight large parlors designed for the use of private parties. The new steamer, which will cost about \$200,000, is to be built primarily for service during the coming Jamestown exposition,

commemorating the first settlement of America and which will be held in 1907. The exposition grounds are located on Hampton Roads, where water transportation facilities are to be used extensively and the great naval display which the United States government has arranged for the event and in which it is asking the co-operation of all foreign nations will take place on the waters of Hampton Roads and Chesapeake bay, insuring a heavy demand for the especial class of steamers represented by the vessel for which plans are now being drawn.

### BIDS FOR MORTARS AND GUNS

Washington, D. C., April 22.—Bids were opened at the Bureau of Ordnance, War Department, today for furnishing steel for 12-in. mortars and 6-in. rapid fire guns. The bid of the Midvale Steel Co. for the 12-in. mortars was 21 cents per pound for gun steel forgings and 30 cents per pound for nickel steel, delivery to be made in forty-five days. For the 6-in. rapid fire gun the Midvale company submitted a bid of 21 cents per pound for gun steel and 40 cents per pound for nickel steel; delivery to be made in sixty days. The Bethlehem Steel Co. also bid on material for both classes of ordnance. For the 12-in. mortars the Bethlehem company offered a bid of 21 cents per pound for plain gun steel and for nickel steel made a bid of 30 cents per pound; delivery in each case to be made within forty days. For the 6-in. rapid fire guns the bid of the Bethlehem company was 21 cents per pound for plain gun steel and 40 cents per pound for nickel steel; delivery within sixty days. The Crucible Steel Co. of Pittsburg bid only on material for the 6-in. rapid fire gun. The bid of the Crucible company for plain gun steel was 21 cents per pound and for nickel steel 29 cents per pound; delivery promised within forty days.

### GEOLOGICAL REPORT ON LAKE SUPERIOR ORE

Washington, April 18.—Mr. C. W. Hayes, the United States government geologist in charge, has in preparation his annual report upon the investigation of nonmetalliferous minerals for the past year. In the course of this valuable treatise he will have the following to say regarding iron ore:

"In view of the dominant influence of the Lake Superior region in the iron industry and the active prospecting being carried on in the various districts, it is considered essential that some field work should be done there each season. This consists in the correction and amplification of maps and sections as better data become available. A summary report on the iron districts of the region is in process of preparation. This will not only summarize the economic geology of the several monographs already published but will embody such new information as has been obtained concerning the extent and relations of the ore deposits. During the past year field work has been done by Messrs. Van Hise, Leith and Seaman."

Interesting experiments are to be made in the near future, in the open roadstead near the Virginia capes, to determine the value of the latest improved system for coaling ships at sea. The battleship Illinois and the collier Marcellus are to be employed in this test and the system to be used is the familiar one involving a system of cables between the collier and the warship, although there are said to be certain new features in the installation which make the result of interest.

It is stated at the bureau of construction and repair that work has only just commenced upon the plans of the two new 16,000-ton battleships which now constitute practically the only new naval tonnage for which bids have not yet been received. It is estimated that the plans will not be completed before September next and probably bids will not be opened and contracts awarded prior to January, 1906.

## LIVERPOOL SHIPPING LETTER

Liverpool, April 27.—Lord Inverclyde presided over the annual meeting of the Cunard Company's shareholders held at Liverpool on Thursday, April 13, and in moving the adoption of the report and balance sheet referred to the circumstances which had prevented the directors declaring a dividend as in previous years. He did not do so, he said, in any spirit of apology, for no other policy than that which was adopted in regard to the rate war would have been possible. He recalled the conditions which they were required to face by the alliance between the Continental shipping companies and the International Mercantile Marine Co., their chief competitors in the North Atlantic trade, and added that the Cunard company had to withdraw from the North Atlantic Conference in order to protect its position. In the first place the combined lines entered into an offensive and defensive alliance aimed directly against the Cunard company. The fact was admitted in a recently inspired article in a German financial paper. The Cunard company was bound, therefore, to place itself in such a position that it could defend itself when attacked and it was attacked both in Britain and on the continent of Europe. In beginning the war of rates, the German companies could not of themselves have done much harm, but they called upon the American combine to join them, and not only so, but they induced certain British lines to join them under a promise to make good the losses. Whether those British companies could look back with satisfaction at having been in the pay of the Continental lines was an open question, but as far as the Cunard management was concerned, beyond the loss of revenue, which was serious, the directors did not in the least regret one single step that they had taken. The war went on until October last. The result of the conference at Berlin in that month was that rates were now at their former level, but the tentative agreements then entered into had not yet been completed, so that there was really no agreement between the Cunard company and the Continental and American alliance. The Cunard company refused to be bound on any one point unless everything was settled, and as the combine had lately intimated that they were not able to arrange to carry out one of the most important clauses of the settlement, all tentative arrangements had thereby become inoperative. What would be the next step and whether rates would be maintained was more than he was able to say, but so long as the shareholders gave the directors their confidence, the board would stand up for their legitimate rights and defend their interests. He was glad to say that they had retained the steady support of clients and customers both in this country and in the United States; but not only had they had to face ordinary commercial rate-cutting, but the Continental lines had had government support not given to British lines, and international pressure had been put on the Hungarian government to withdraw from their agreement with the Cunard company. The Hungarian government, however, had stood loyally by them. Further, Cunard agents on the Continent had been attacked in those parts of their business not related to the company, and passenger agents in the United States had been boycotted to such an extent that some had severed their connection with the Cunard company and others had had to be appointed. What would happen in the future he could not prophesy; all he could undertake was that the board would continue their policy of independence and enterprise. The concluding portion of Lord Inverclyde's address dealt with the persistent efforts of the Mersey Docks & Harbor Board to alter the basis on which dock and harbor dues are charged from net register to 50 per cent. of the gross tonnage of ships, the effect of which would be to levy an exceptional, and in the opinion of the directors an unjustifiable charge from the company's fast mail ships. He felt bound to say that the Mersey Dock Board appeared to be making a strong set against the Cunard company, so much so that he was almost forced to

believe that they would be glad to see them leave Liverpool with their fleet and go elsewhere, but he doubted whether the city of Liverpool shared in such views. At no other port, British or continental, to which fast ships went, were they regarded in the same spirit as by the Mersey Dock Board. Replying to criticisms passed by a shareholder, Lord Inverclyde said that instead of spending too much money on new ships, the company had not had enough new ships. He was quite sure they had not in any way gone beyond what they were justified in contracts they had made in connection with shipbuilding. It went without saying that the directors would not have put their resources which they had been gathering up in the last few years into new ships unless they believed it would be entirely to the advantage of the company, and would give better results than if it was lying in the bank on deposit receipt. The policy of the directors was then formally approved unanimously.

The receipts of the Suez Canal from shipping in March for the past three years and for the first quarter of the same periods were:

	1905.	March, 1904.	1903.
Ships .....	407	400	323
Receipts .....	10,670,000f.	10,680,000f.	8,700,000f.
	1905.	Three months of 1904	1903.
Ships .....	1,207	1,070	916
Receipts .....	31,811,998f.	29,021,398f.	24,915,542f.

Liverpool Atlantic steamship lines have just received copies of the revised United States government regulations for the construction and equipment of vessels plying to and from American ports. The regulations are most voluminous and minute, and cover 120 pages of print. The old regulation as to the number of boats to be carried by lines is varied by the condition that an extra "working" boat must be carried, and minute instructions are given as to the equipment of each boat, down to "at least one box of matches wrapped in a water-proof package and carried in a box attached to the underside of the stern thwart." A duplicate set of lifebelts or "life preservers," as they are called in the regulations, must also be carried. It is said that representations are being made by the Liverpool Steamship Owners' Association to the British foreign office in order to secure an assimilation of the American and British regulations as to the construction, manning and equipment of Atlantic liners.

I have had confirmation that five steamships of the fleet of the Mediterranean and New York Steamship Company, Ltd., managed by Messrs. Phelps Bros. of Liverpool and New York, have been sold to Messrs. Watts, Watts & Co., for transfer to Japan. The boats are the Picqua, Pawnee, Powhatan, Pocasset, and Pocahontas, and are said to have been sold for about \$225,000, in all. For many years this line enjoyed practically an unmolested trade from New York to Italy, etc., and back again, but with the advent, in recent years of the large passenger lines of English and foreign ownership, their cargo trade has been seriously cut into.

Mr. John W. Hughes, of Messrs. T. & J. Harrison, steamship owners of Liverpool, has been appointed to the vacancy on the board of the Suez Canal Company, caused by the retirement of Mr. J. B. Westray. Mr. Hughes, who is chairman of the Works Committee of the Mersey Docks & Harbor Board, will be perfectly familiar with questions affecting the Suez Canal, since one of the branches of his firm's business includes a service to Calcutta.

It is officially stated by the Orient Steam Navigation Co. that they have now concluded the contract with the federal government of Australia for a fortnightly mail service between Britain and Australia. The subsidy agreed is \$600,000 per annum, and the contract will run from the present time until January 1908.

From the returns compiled by Lloyd's register of shipping.



it appears that excluding warships, there were 474 vessels of 1,251,343 tons gross register under construction in the United Kingdom at the close of the quarter ended March 31 last. The tonnage under construction is now nearly 202,000 tons more than at the end of December, 1904. Compared, however, with the total reached in September, 1901, which is the highest on record, the present figures still show a reduction of about 161,000 tons. Of the 474 vessels under construction 5 are of 20,000 tons and upwards, 3 between 15,000 tons and 20,000 tons, and 3 others over 10,000 tons. The work in hand at the chief shipbuilding districts (warships excepted), is generally greater than at the same period last year. The warships at present under construction in the United Kingdom number 43 of 262,670 tons displacement. Of these 38 are British and five foreign (or not stated). The former include three first-class battleships, and five first-class armored cruisers, building in the Royal dockyards, and in private yards seven first-class armored cruisers, five scouts, eleven torpedo boat destroyers, and seven submarines. The foreign orders include two battleships, two torpedo boat destroyers and one torpedo boat.

The new French transatlantic steamer is said to be a considerable step in advance of the company's preceding steamers, especially in speed, although the dimensions approximate more to the Campania and Lucania than to the later high-speed German liners. The aim is to get a speed of 23 knots on the Atlantic, and for this the twin sets of triple-expansion engines are designed to give 30,000 I.H.P. or 1.57 I.H.P. per ton of displacement in normal sea-going trim. The largest and fastest of present-day Atlantic liners, the Kaiser Wilhelm II., has 1.5 I.H.P. per ton. The other and shorter German liners have a greater ratio of power to weight, but in the Campania, with a speed of 22 knots, the proportion is 1.1 I.H.P. per ton. The French vessel must either have exceptionally fine lines, or the anticipations of speed are sanguine. The fastest French boats have made the voyage at an average speed of 21.9 knots; but they have felt the pinch of competition of the 23-knot German boats calling at Cherbourg. This new vessel, which has just been launched, is a vessel of convenient size, being 625 feet long, 64 feet 7 inches beam, and 26 feet 7 inches draft, with a displacement of 19,160 tons. The largest of existing French liners is 582 feet 4 inches long, and of 15,400 tons displacement. They have adopted Howden's system for the boiler installation, which includes 21 cylindrical boilers, all single-ended. The total number of passengers provided for is 1,935, compared with 960 in the existing ships; but the total given compares well, notwithstanding the smaller size, with the passengers carried in the large German vessels. An interesting detail is that steam turbines will drive the electric dynamos for the lighting of the ship.

#### ADMIRAL MELVILLE'S ADDRESS

At a recent meeting at the Academy of Political and Social Science in Philadelphia, Brigadier General Tucker H. Bliss, president of the Army War College, presided. An address of much significance was made by Rear Admiral George Wallace Melville in which he touched upon various points of interest. Among other things he said:

"The lessons of the Russo-Japanese war are plain and simple, and should be taken to heart by all people. It is the committant features of both military and naval organizations that have been neglected by the Russians. For the next few years, therefore, it should be in the special direction of developing the auxiliaries of naval strength and not toward augmenting the number of fighting ships wherein we should direct our best energies. Our naval budget for the next ten years must be a large one, for, if possible, we should provide for a progressive increase in actual fighting naval strength that would be equivalent to the net gain of a battleship. The bulk of the expenditures for increasing the efficiency of our navy should, however, be applied as follows:

"The preparation of plans for the immediate abandonment at the slightest possible loss, of every distant possession that is likely to require a fleet to defend it. If it should be understood that in time of war we propose to abandon, at least temporarily, certain territorial possessions, neither the morale nor the credit of the nation would then be impaired by the seizure of such territory by an enemy.

"Improvement of the channels leading to all ship building plants, naval stations and maritime distributing ports.

"The building of a fleet of large and fast colliers, so that in time of war practically all the coal required for naval operations distant from our own shores would be available for immediate shipment to the place where most needed. We should abandon the policy of placing any great reliance upon fixed coaling stations, for coaling stations will have to be defended.

"The rehabilitation of all navy yards to a condition where it would be possible, in case of necessity, to build any type of warship at any one of these stations.

"The providing of a reserve of naval officers for emergency purposes.

"The establishment of a naval reserve.

"The restoration of our merchant marine. I have no hesitation in asserting that it would subserve military, commercial and national interests to stop building battleships and devote all or a portion of the money thus saved to placing on the ocean a merchant marine that would help us to secure a greater trade of the world and which, in case of war, would prove a military auxiliary only one less remove in importance than the battleship itself.

"The recognition of the fact that the modern navy is an engineering one and that the training of both officers and men should be more technical in character."

#### TRADE CONDITIONS AT DULUTH

Duluth, Minn., April 25.—The lengthened steamer Victory, rebuilt at the yard of the Superior Ship Building Co. has been floated out and taken on a load. She is now 459 ft. over all, with a gross tonnage of 4,527, net 3,707. The consort Constitution is not yet quite ready to go out. She will be 452 ft. over all and with net tonnage of 3,613. Work on the Perkins, Steel Corporation's new 509-footer, is going well and the launch will take place shortly. The yard is quite busy on other work and it putting on several wheels stripped by contact with ice on the lower lake.

Boats began arriving again at the upper end of Lake Superior on Monday night, and there is now reason to believe that the trouble is over. The ore docks had ceased business, the steam shovels had been closed down and the mines were working half handed, while the traffic between mines and docks had been reduced to a minimum. This was a factor in settling the miners' strike whose influence should not be lost sight of.

One cargo of wheat, 82,000 in the St. Lawrence ship Davidson, was sent from here to Chicago, and another was loaded of 99,000 on the Scranton, but the latter was not out before the "May deal" there had ended disastrously for Gates and his crowd, and the wheat was not needed, so it is probable that cargo will be diverted to Buffalo. There is very little wheat sold at the head of the lakes for early shipment, and there is little hope for much business unless an export trade eventuates. This is said by leading exporters at the head of the lakes to be inside the possibilities, now that the congestion in prices has been stopped and the markets are in line. All grains but wheat and flax, in store at Duluth, increased last week, and there are now about 5,000,000 bushels of oats there, not to mention the wheat, flax and other grains.

The Lorain Dredging Co.'s dredge No. 7 is at work for the Pennsylvania Railroad Co. in the harbor at Ashtabula.



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Especial interest centers at present in the Russian fleet owing to the naval engagement impending under circumstances so momentous as probably to change the relative standard of nations. The present war in the far east has been an unbroken series of successes for Japan but should Rojestvensky's fleet now defeat Togo's, it would make the Japanese successes go for naught because it would effectually isolate Japan from her land forces in Manchuria. Nor is the outcome the foregone conclusion that so many believe. Rojestvensky has earned the contumely of mankind in his progress from the Baltic, owing to the unfortunate North Sea incident, but he has nevertheless brought his ships intact into the enemy's sea, and he possesses the undoubted advantage of numbers. He has seven battleships against Togo's four and a great variety of small craft.

An awakening interest in the forthcoming semi-centennial celebration of Sault Ste. Marie Canal is already to be noted. Inquiries are being received from all parts of the country concerning it and some publications are already projecting articles upon the history of the canal. Had it not been for the indefatigable labor of the Hon. Peter White of Marquette, Mich., however, no celebration would have occurred. It was only through his personal effort that congress and the Michigan legislature were persuaded to make ap-

propriations to celebrate the event. Now that so much has been done by him, however, the iron ore companies and the vessel interests should unite in making the celebration a fine one. Probably in no part of the world has development been so marked as it has been in the great lakes region. In July of this year will occur the fiftieth anniversary of the opening of Lake Superior to commercial navigation. It is scarcely believable that Lake Superior in a commercial sense is only fifty years old and yet prior to that time this mighty lake had scarcely more than a dozen small schooners on it. One of these schooners was the old Algonquin now lying in the bull rushes near Duluth. It was intended in 1893 to raise her and exhibit her at the world's fair. It would be a very good idea to raise her now and exhibit her with one of the 10,000 ton ships of the Steel Corporation. As an example of fifty years' development the comparison would be most striking. Assurances have been received from federal authorities that both the army and navy departments will do everything within their power to contribute to the success of the celebration. The subject is naturally one upon which the Lake Carriers' Association should take action.

The season of 1905 will be remembered on the great lakes as one which opened most disastrously. That the best laid plans of mice and men gang aft agley is very well exemplified by the vicissitudes which have accompanied the vessels that made the early start. While a number of coal carriers left Lake Erie on April 8, it will be some time yet before they complete their round trip, having reached the head of the lakes after considerable delay and after having received serious injuries. Even now westerly winds are piling ice into Whitefish bay and the Lake Superior run is by no means a popular one. What with the chartering of ice crushers and tugs to clear the channel, the piling up of operating expenses without any return in earnings and the injuries inflicted by the ice to the vessels themselves the loss will reach a considerable figure. The ship building concerns on the great lakes will have a great deal of repair work to do in addition to the new tonnage that is under way. The shippers were naturally anxious to start the season of navigation as early as possible, but the April movement will now be inconsiderable and the season will not be under way before May 1. From May to November will therefore have to be a succession of record breaking months if the total movement of ore is to reach 30,000,000 tons, which is the amount that is practically under charter to be moved. From the vessel standpoint no difficulty will be experienced in handling this great movement for the reason that they handled an almost equivalent movement during several months of last year. There will doubtless be a great rush of ore as soon as the channels are free from ice because the shippers will naturally not feel secure until a reasonable portion of ore which they have sold is actually on Lake Erie docks.

## ANCHOR LINE DINNER

The annual conference of agents and officers of the Anchor Line was held in Cleveland this week. Much business pertaining to the work of the line was accomplished and, as usual, it was brought to a close by a dinner tendered to the agents by the officials of the company. Dinner was served on Wednesday evening on board the Tionesta as she lay alongside the Juniata in the old river bed. About sixty persons were present, the guests including Mr. James C. Wallace, Mr. Russell C. Wetmore, Mr. O. J. Fish, Mr. Harvey D. Goulder, Mr. Frank Masten and Mr. E. M. Wentworth. Mr. Frank J. Firth, president of the Erie & Western railway, acted as toastmaster and the first speaker of the evening was Mr. Harvey D. Goulder. Mr. Firth in introducing him spoke briefly of the growth of lake commerce and deplored the fact that a like growth was not to be exhibited in the foreign trade. Mr. Goulder took as his subject the Merchant Marine League of the United States and what it hopes to accomplish. He said briefly that the effort of the league was to set people thinking.

"We desire, of course," said he "that you should agree with us but we would prefer that you talk about us. We would rather be violently opposed than that no interest should be exhibited in our work. If you oppose us we know that you must do some thinking, and if we can get the people thinking we are pretty sure to accomplish what we have set out to do. We are the largest exporting country in the world. We pay annually \$200,000,000 in freight on the goods we ship and yet we carry but 9 per cent of our commerce. We haven't a single ship building for the foreign trade and have not had for three years; and we haven't a square-rigged ship building for any trade. The difficulties in the way of establishing a American merchant marine are first the higher cost of construction due to higher wages, and second the higher cost of operation. An American sailor will not work for double the wages that a foreigner gets; and if we put foreigners on our ships they will not work for wages that are not commensurate with those that they could earn on shore in the United States. What are we going to do about it? The Hanna-Frye bill was devised to remedy this condition. Mr. Firth and myself had something to do with drafting that bill. There was much talk about it, about the building berths being taken under options and schemes invented to have the \$9,000,000 provided in the bill for annual expenditure slide into a few pockets. We know that much of that talk was buncombe but the bill was nevertheless withdrawn because the opposition to it was too great. Then congress conceived the idea of a Merchant Marine Commission to investigate the subject. The result of the commission's observations is a three volume book. The commission found the country suffering by reason of not having a proper merchant marine of its own. The railways get our products to the seaboard at a lower railway freight than obtains in any country but there we stop. We have no ships on the sea and the foreigner carries our products. Officers of foreign ships are naturally desirous of booming the product of their own country and they continually disparage American products. The South American market is accustomed to having heavy machinery and if we built our machinery as heavy as our foreign competitors the freight upon it by the time it reaches the South American market wipes out all profit. It has a longer haul because it has to go to Europe first before it goes to South America. If we make machinery light to equalize the difference in freight we find that the South Americans will not buy it because they are not accustomed to the kind. The Commission also found that we were suffering in the southern states because there are no regular steamship lines leaving them and they have to depend upon the occasional tramp. And so we go."

Mr. Goulder then outlined the provisions of the bill drafted

by the Merchant Marine Commission and said that while it probably does not go far enough the Merchant Marine League nevertheless endorses it and is favorable to its passage. He believed that about \$3,500,000 per annum would be realized in tonnage dues from the measure and that for the first year at least no more than \$3,000,000 could be expended under the measure. He felt that as long as the government was spending vast sums to build the Panama canal, to build up a navy, and had spent a great sum to acquire the Philippines, that it was time that something was done for shipping. He added that in the event of a great international war, which certain authorities do not regard as improbable, the United States would find its products for export stalled at the seaboard and that a panic, such as the country has never experienced, would be precipitated.

Mr. Frank J. Firth said that he believed the question of shipping in the foreign trade to be one of the most important subjects now before the people. He related that he had been asked by certain senators if the natural law of supply and demand should not be permitted to operate in this trade. To this he replied that if it had not been for national legislation there would be no American flag on the great lakes. Protection, he said, had built up the great fleet of the lakes and he exhibited it as one of the splendid results produced by artificial means.

Mr. James C. Wallace, who was next called upon, said that when the Merchant Marine Commission was in Cleveland he had told them that as far as the great lakes were concerned they were not in need of subsidy. The great lakes trade is protected in every way and vessels have got so large now that it is impossible for foreign ships to be built at all for the serious business of the lakes. He said that an occasional ship came over from Scotland to enter the Canadian grain trade and that he understood that six more had been ordered for this service.

"They are vessels," said he, "that we would be ashamed to produce. They are built light and about half as cheap as we could produce a ship."

Referring to the Juniata he stated that she would be turned over to the company in about fifteen days. He related that the vice president of the Anchor Line had made a wager with him that the American Ship Building Co. would make enough money out of the Juniata to declare a dividend on its common stock. He begged to assure his hearers that there would be no dividend on the common stock. He also stated that a further wager had been made of an overcoat that \$40,000 would be made upon her and a second wager of two overcoats that \$25,000 would be made. He had just gone over the books, he said, and had discovered that the company would scarcely make a profit of \$12,000 on the Juniata. He hoped, however, that Mr. Evans would hurry up and give him a contract for another boat.

Mr. E. T. Evans said that he understood that the construction of the Juniata had been record-breaking in the annals of ship building and asked Mr. Wallace for the details. Mr. Wallace replied that the contract for the Juniata had been signed on August 24 but as some details had not been settled it was September 2 before orders were given for material. The mills furnished it, however, very promptly and the keel was laid Oct. 10. The ship was launched on Dec. 22 and could have been completed a month ago had it been necessary for the company to have her. Mr. Wallace stated that it was very quick work indeed but that the principal reason for it was the promptitude with which the mills had furnished material. Today no such promptitude is to be had as the mills would only promise to furnish part of the material three months after specifications are in hand.

Mr. E. N. Wentworth of the Star Union Line, the all-rail route, concluded the speaking with a few humorous remarks which were much enjoyed by those present.



VIEW OF ST. CLAIR PLANT FROM THE RIVER.

### LAUNCH OF THE GEORGE H. RUSSEL

The steamer George H. Russel building for the Gilchrist Transportation Co. of Cleveland at the St. Clair yard of the Great Lakes Engineering Works was successfully launched on Saturday afternoon last. The steamer was christened by Miss Julia Russel, daughter of Mr. George H. Russel, who broke the customary bottle of wine very thoroughly just as the steamer started. The launching party consisted of Miss Julia Russel, Miss Ruby Boyer, Mrs. Frank Gilchrist, Mr. and Mrs. J. C. Gilchrist, Mrs. Allen Edwards, Miss Blanch Bissell, Mr. and Mrs. Antonio C. Pessano, Miss Elizabeth W. Pessano, Mrs. Charles Marston, Mrs. E. T. Barbour, Mr. and Mrs. Robert E. Plumb, Miss Myra Plumb, Mr. and Mrs. Wilkinson, Dr. A. Morrison, John Gilchrist, C. C. Jenks, Bryant Walker, A. J. Gilchrist, Ralph Gilchrist, A. W. Russel, George H. Russel, John R. Russel, A. H. Sibley, Mark Sibley, R. E. Schuck and Perry C. Walker.

The guests were taken from Detroit to St. Clair on special cars, stopping enroute at Marine City for lunch. A feature of the launch was the passing of the great steamer Augustus B. Wolvin just prior to the release of the Russel. The Wolvin saluting hoarsely as she went by. The Russel is 484 ft. over all, 464 ft. keel, 50 ft. beam and 28 ft. deep. She will be equipped with triple-expansion engines with cylinders 22, 36 and 60 in. diameters by 40 in. stroke, supplied with steam from two Scotch boilers, 13 ft. by 11 ft. 6 in.

She will have a carrying capacity of 7,600 tons. The Russel is the second steamer to be launched at this yard but the first since it was taken over by the Great Lakes Engineering Works.

Mr. George H. Russel after whom the steamer is named, comes of the most vigorous of Detroit's early stock. His father, Dr. George B. Russel, was one of the most successful physicians of this region in the early forties, and a man also

of business training and instincts. He built the first iron furnace erected west of Pittsburg, and was one of the founders also of the first car building company in Detroit. Into these enterprises the son naturally came. George H., born Nov. 29, 1847, received a grammar school education, and began his business life as yard foreman of the Detroit & Lake Superior Iron Manufacturing Co. Two years later he became bookkeeper of the Hamtramck Iron Works, and a couple of years afterwards was elected secretary and treasurer of the same concern. In 1872 he was chosen to the like positions in the Detroit Car Works. Both companies became embarrassed after the panic of 1873, and Mr. Russel started a small iron foundry on his own account. This has since grown into the Russel Wheel & Foundry Co., which is counted among the large manufacturing enterprises in the city.

Next to his manufacturing interests, Mr. Russel's banking affairs have had the most prom-



MR. GEORGE H. RUSSEL.



inence. He was chosen president of the State Savings Bank in 1889, president of the Michigan Banking Association in 1891, and president of the American Bankers' Association in 1898.

He was also president of the Detroit Stock Exchange in 1901, and was an active official of the Detroit Board of Commerce from June 1903 to April 1905. He is interested in a number of manufacturing enterprises in addition to the

one which he founded, the latest one, in the organization of which he was the moving spirit being the Great Lakes Engineering Works.

In social life the Russel family are prominent. In politics Mr. Russel has always been an ardent Democrat, but has never held or sought elective office. He was, by appointment, president of the first Park and Boulevard Commission, which inaugurated the present system of park adornment for the city.

#### SAULT CANAL CELEBRATION

It is now or will be this summer fifty years since the first canal at Sault Ste. Marie was opened to commerce. Through the indefatigable efforts of Hon. Peter White of Marquette, Mich., congress has appropriated \$10,000 and the legislature of Michigan \$15,000 to aid in marking the event with an appropriate celebration. The last congress was opposed to appropriations of any kind whatever and it is a great tribute to the persuasive eloquence of Mr. White that he was able to convince congress of the necessity of an adequate celebration. It was not easy work, however, and for a time it looked as though no appropriation would be made. In fact the item was not inserted in the appropriation bill until within five minutes before the final adjournment of congress and it would not have been then had not Mr. White made a personal plea to every member individu-



MISS JULIA RUSSEL.

ally of the conference committee. Mr. White has received assurances from the authorities at Washington that they will do everything in their power to make the celebration a worthy one. Secretary Wm. H. Taft of the war department wrote to him as follows:

"I have received your applications for official aid in the matter of the celebration of the fifty years' anniversary of the opening of the Sault Ste. Marie Canal. I fully appreciate the importance of the event which you desire now to celebrate in view of the enormous growth of the traffic which now finds an outlet through the Canal, and I shall be very glad in every possible official and personal way to further your patriotic object of celebrating this important event in the history of the nation. Anything that I may lawfully do as secretary of war you can count on my doing to make your celebration a success."

He also gave to him an introduction to Hon. Paul Morton, secretary of the navy, in the following letter:

"My dear Mr. Secretary:—This will introduce to you Mr. Peter White of Marquette. If you don't know Mr. Peter White, it is time you did. He is 'the whole thing' up in Northern Michigan. He is a Democrat—just to be peculiar—but he runs the Republican and the other organizations too. He is trying to get up a celebration of the fiftieth birthday of the Sault Ste. Marie Canal. He was in at the birth and he wants to have the celebration worthy of the greatness of that institution. He thinks that the navy has some of its vessels

in that neighborhood which could be used to add to the general festivities. I bespeak for him the attention which the occasion deserves."

Mr. Morton wrote as follows to Mr. White:

"You can rely on the navy department sending the Michigan up to your semi-centennial celebration of the birth of the Sault Canal and also on doing everything it can consistently to make the event a success."

Secretary L. M. Shaw of the treasury department also wrote:

"Dear Mr. White:—Your application for official co-operation in the matter of the celebration of the fiftieth anniversary of the opening of

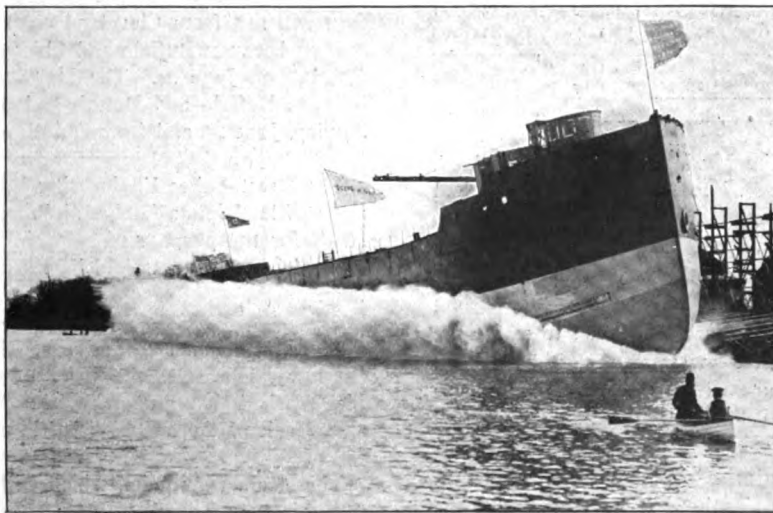
the Sault Ste. Marie Canal, is before me. This department will do everything permissible by law to make the event a

success. We can send you one and possibly two revenue cutters, with plenty of patriotism and powder, both at your service."

Mr. White's argument to congress and to the federal authorities was a very broad one. He claimed that the Sault Ste. Marie canal belonged to the nation and that the nation as a whole had profited through its construction and as a whole should participate in the celebration. Certainly the working of iron is the most diversified of all arts and it has contrib-



PRESIDENT PESSANO AND MISS RUSSEL.



LAUNCH OF THE GEORGE H. RUSSEL.

uted to the welfare of countless thousands. Undoubtedly the great steamship lines and the iron ore companies of the great lakes which have realized direct benefit from the canal will do all in their power to make the celebration worthy of the occasion.

### CHICAGO GRAIN REPORT

Chicago, April 25.—The market is under decidedly dull tendency due to unusual pressure of vessel offerings. The ice obstruction, continuing in the channel beyond every reasonable expectation, has developed a congestion of open capacity in the Lake Michigan field wherein for the time being there is a scarcity of shipping both in ore and grain. Until the more general distribution of tonnage is permitted, freights must undoubtedly remain closely to the minimum carrying charge. The few charters closed within the last couple of days have been at a basis of 1½¢ Buffalo corn; Kingston and Ogdensburg ruling nominally 3¢ corn and Montreal about 4¢ per bushel.

The following are figures showing the immediate and comparative shipping with current stocks of grain in elevators. It will be noted the total shipments since Jan. 1 exceed those of last year by some 10,000,000 bu. which probably finds explanation through the low all rail basis in obtainment up to April 1. The last end of this rail grain, and especially so of corn, is still being "marketed" at eastern terminals, which probably accounts somewhat for the present unusually slow opening demand for vessels.

Lake and rail shipments:—

	This week.	Last week.	Same week last year.
Wheat .....	125,808	113,816	170,715
Corn .....	2,450,200	3,019,036	342,659
Oats .....	753,344	920,510	820,620
Rye .....	30,425	26,075	46,691
Barley .....	36,674	45,000	62,352

	3,405,547	4,130,437	1,449,937
Shipments since Jan. 1, 1905.			Same time last year.

Wheat .....	3,798,050	3,857,070
Corn .....	25,311,915	14,256,685
Oats .....	14,703,568	15,855,682
Rye .....	486,000	613,088
Barley .....	1,771,557	2,151,629

	46,071,750	36,734,154
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Stocks of grain in elevators:—

	This week.	Last week.	Same week last year.
Wheat .....	3,957,000	3,666,000	4,580,000
Corn .....	7,272,000	7,670,000	9,054,000
Oats .....	5,553,000	6,283,000	4,328,000
Rye .....	172,000	150,000	438,000
Barley .....	63,000	51,714	411,000
	17,017,000	17,826,714	18,820,000

### BUFFALO WEIGHMASTER EXCEPTS

Editor Marine Review:—The Marine Review of Cleveland, April 20, says: "Capt. James B. Foote, marine superintendent of the Canadian Lake & Ocean Navigation Co., of Toronto, while in New York last week, spoke with great intelligence." etc., etc. Let us see if this is quite the way to state it so far as the weighmasters are concerned: I also quote—"Regarding the efforts of vessel owners to secure legislation to revise the average and shortage grievance, he stated that it had failed because of the hesitancy of men within the ranks. Whatever difference exists between the bill of lading and the actual cargo is charged against the vessel. Sometimes it is in favor of the vessel, but in the majority of cases it is against it. Of course no vessel leaks grain through its seams, and the mistakes are doubtless those of the weighmasters. Any loss in transit should not amount to a half bushel in a thousand

bushels, due to the accumulation of dust, but at the close of the season several owners found themselves short on delivery in amounts varying between 900 and 3,000 bushels," etc., etc.

Coming from a man who has failed to employ the deputies of the Lake Weighmaster of the Chamber of Commerce, although receiving the benefit of his work in seeing that everything here is in proper condition to assure accuracy; without any compensation from these boats, and certainly without any adequate knowledge of the matter, another witness will have to be called to prove that he "spoke with great intelligence" on this point.

As to loss, he speaks of half a bushel per thousand as a sufficient amount. The truth is that my average for twenty-five years past does not exceed a peck per thousand bushels.

His craft are in the Canadian trade. Those coming to Buffalo must necessarily come from there. I do not know what results they had on delivery at Canadian ports, but I do know about it here on craft loading there last season. There were four very large discrepancies. Capt. Foote is quoted as saying: "The mistakes are doubtless those of the weighmasters." The fact is that the house where they loaded is so constructed that after the grain is weighed it may go elsewhere than to the boat. We know that this occurred on two of them. I am told that on another the weighmaster's department was entirely blameless in the matter, and the fourth was a Canadian craft, doubtless settled there in some way. I did not have her work.

JUNIUS S. SMITH,

Lake Weighmaster, Chamber of Commerce.

Buffalo, April 24.

The purchase of the Ann Arbor road by President Eugene Zimmermann of the Cincinnati, Hamilton & Dayton road; Rudolph Kleybolte and other financiers of Cincinnati, will mean a great deal more for the large car ferry ports on the chain of lakes than would appear upon the surface. This purchase, rumored for some days past, has finally been confirmed by Mr. Kleybolte, and the purchasers will at once take over the Ann Arbor road in Michigan and its car ferry system at Kewaunee. While the sale is made to individuals, it is known that it was carried through directly in the interests of the Cincinnati, Hamilton & Dayton road. This latter road forms a part of the recent combination of the Pere Marquette, the Cincinnati, Hamilton & Dayton and the Eastern Illinois, which combination is known as the Great Central route, and, of course, the Ann Arbor property will be added to this already extensive combination of railway and car ferry properties.

The steamer Northland of the Northern Steamship Co.'s fleet will sail from Cleveland on Thursday, June 22, and will operate between Buffalo and Chicago. She will first sail from Chicago on June 24. The Northwest will be in commission between Buffalo and Duluth and will sail from Cleveland on Sunday, June 25, and from Duluth on Tuesday, June 27.

The Great Lakes Engineering Works has purchased twenty acres of land immediately adjoining its plant at Ecorse on the south for the purpose of enlarging its facilities. One of the earliest improvements will be the dredging of a slip 1,000 ft. long.

The first steamer to arrive at Milwaukee this season from the lower lakes was the Utica of the Western Transit Line. She reached that port with two damaged plates in her bow as a result of the ten days' battle with the ice.

The steamer Arundel, which will run on the Crystal Beach line this summer will leave Detroit where she is wintered on May 24 and will open the steamer excursion service for Buffalo on May 27.

## WORK AT NEWPORT NEWS

Norfolk, Va., April 25.—The new United States armored cruiser Maryland, sister of the West Virginia, Pennsylvania and Colorado, was placed in commission yesterday at the yard of the Newport News Shipbuilding and Dry Docks Co., her builders. This was the first time in the history of the yard that a vessel built for the United States government was turned over in an incompleated condition. The government has not furnished the six-inch guns and other rifles for the secondary battery of the cruiser. This armament will be ready sometime in June and it is understood that the Maryland will be sent to the New York navy yard to receive it. The commissioning of the cruiser took place with all of the customary formalities. General Manager W. A. Post, representing the builders, formally turned the ship over to Capt. Royall R. Ingersoll, representing the navy department. Capt. Ingersoll read his commission, the flag was hoisted at the stern and the band played "The Star Spangled Banner." The crew of the ship, which was assembled on the receiving ships at the Norfolk navy yard, was transferred to Newport News Monday and yesterday. The keel for the Maryland was laid Oct. 29, 1901. The ship was launched in September, 1903.

The United States gunboat Newport, which recently lost her propeller at sea while bound from Boston to Santo Domingo (Hayti), having received a new propeller and completed other repairs at the navy yard, sailed Monday for her original destination. She goes to Santo Domingo for service as a guard ship between Monte Cristo and Puerta Plata.

It is reported that the resident officials of the Newport News Shipbuilding & Dry Docks Co. have made requisition upon the company for a new dry dock, to be nearly as large as dock No. 2, at that yard, which measures over 800 ft. in length. During 1904 nearly 300 vessels were docked in the two monster timber basins operated by the company. The presence of the two docks undoubtedly is responsible for a large percentage of the repair work handled by the yard. Officials of the company state that the dock recently asked for will not be constructed at once.

The battleship Texas and the monitors Arkansas, Nevada and Florida will arrive in Hampton Roads this week from the south, where they have been engaged in gunnery practice and maneuvers. They will go to the navy yard here for an overhauling preparatory to their participation in the army and navy exercises scheduled for Hampton Roads and the Chesapeake bay early in June. The battleship Massachusetts and the other vessels, including torpedo craft, of the coast defense squadron will be assigned to duty in the Chesapeake during the approaching maneuvers. The Texas and the monitors left Hampton Roads January 9, after the naval review, and proceeded to Culebra, stopping at Port Royal on the run down the coast. From Culebra the scene of operations was shifted to Guantanamo and when the naval maneuvers there were completed the four vessels proceeded to Pensacola, where the gunnery tests took place. The ships are due to reach Hampton Roads today or tomorrow.

The fast protected cruiser Columbia passed out of the Capes Monday bound for Vera Cruz, Mex., having aboard the remains of H. E. Senor Azpiroz, the late Mexican ambassador at Washington. The family of the diplomat accompanies the body, which was placed aboard of the cruiser at Annapolis, having been sent there from Washington by train.

Lieutenant Evans, U. S. N., commanding the President's yacht Sylph, which took Mrs. Roosevelt and party south several weeks ago, has reported to the navy department that while his vessel was disabled off Hatteras aid was refused by the American fruit steamer Oteri, whose master saw his plight and refused to take him in tow when requested to do so. Lieut. Evans claims that the master's only reply was that he was not a towboat. The Sylph was later picked up by the Morgan liner El Cid, after being exposed to a hurricane with

helpless machinery. At Baltimore, where the Oteri put in, her master, Captain Hatville, claims that the Sylph was not in a dangerous position or condition and that as he had a perishable cargo aboard he did not deem it necessary to stop to attach a towline. He denies that he replied to the commanding officer as indicated by Lieut. Evans. He also insists that he did not know that the vessel was the president's yacht.

The battleship Connecticut, building at the Brooklyn navy yard, is rapidly gaining on the Louisiana, which is under way at the Newport News shipyard. Last month the Connecticut gained 3.07 per cent., while the other ship gained only 2.36 per cent. The Louisiana is now 71.9 per cent. completed and only 1.66 per cent. ahead of the Connecticut. While the officials at the Brooklyn navy yard are exultant over the excellent showing made by their construction force, the Newport News shipbuilders are taking the situation calmly and declare that the next few months will see changes that will put their ship considerably ahead of the other. The comparatively small progress made at Newport News on the Louisiana is accounted for in the rush of commissioning the Maryland and putting finishing touches on several ships building and repairing.

## GENERAL RIVER NOTES

As the result of an order issued by George Uhler, supervising inspector general of steam vessels of the United States, the large cork companies of this country are flooded with orders for life preservers. This order condemns every life preserver on United States' vessels composed of kapok and loose granulated cork. All made of such substances must be replaced by preservers made of compressed cork no later than May 1.

On Saturday and Sunday, April 22 and 23, 7,000,000 bu. of coal, amounting to 275,000 tons, cleared from the Pittsburg harbor. On Saturday the shipments reached a total of 8,000,000 bu., establishing a new record for a day's shipments. Model barges containing 12,000 tons of iron and steel products also cleared. The coal and finished iron and steel was all consigned to southern points on the Mississippi. The largest shipments were made by the Monongahela River Consolidated Coal & Coke Co., while the shipments of C. Jutte & Co. were the largest among the independent coal interests.

Contracts for the completion of dams Nos. 3, 4 and 5, of the Ohio river series between Pittsburg and Beaver, Pa., will be awarded in a few days, the bids having already been opened and are now in the hands of the war department. As soon as these contracts are awarded, the work already commenced will be pushed to completion and it is believed that the deeper channel to Beaver will be available in about a year. Bids for dredging a new channel in the Ohio river opposite Glenfield, Pa., have also been asked by Maj. William L. Sibert in charge of the improvements of the Allegheny, Monongahela and upper Ohio rivers. The channel which is only 250 ft. wide is to be increased 200 ft. A movable steel top, 3 ft. high, is also to be built on dam No. 2, Monongahela river, which will increase the depth of the water in this pool at low water stages 3 ft. Bids have also been asked for the construction of steel gates for the new lock at Brilliant in the Allegheny river. The contract for the erection of this dam will be awarded in a few days. All the Ohio river dams between Pittsburg and Beaver will be built to afford a 9 ft. channel and it is for the purpose of considering the advisability of canalizing the Ohio throughout its length to this depth that the congressional rivers and harbors committee will make its trip down the Ohio in May.

Cobb, Butler & Co., Rockland, Me., have lengthened the steamer Vinalhaven 15 ft. for the Vinalhaven and Rockland Steamboat Co.



IMPRISONED IN THE ICE—FIRST TRIP OF ORE CARRIERS TO LAKE SUPERIOR.

#### CONDITION OF ICE AND FREIGHT SITUATION

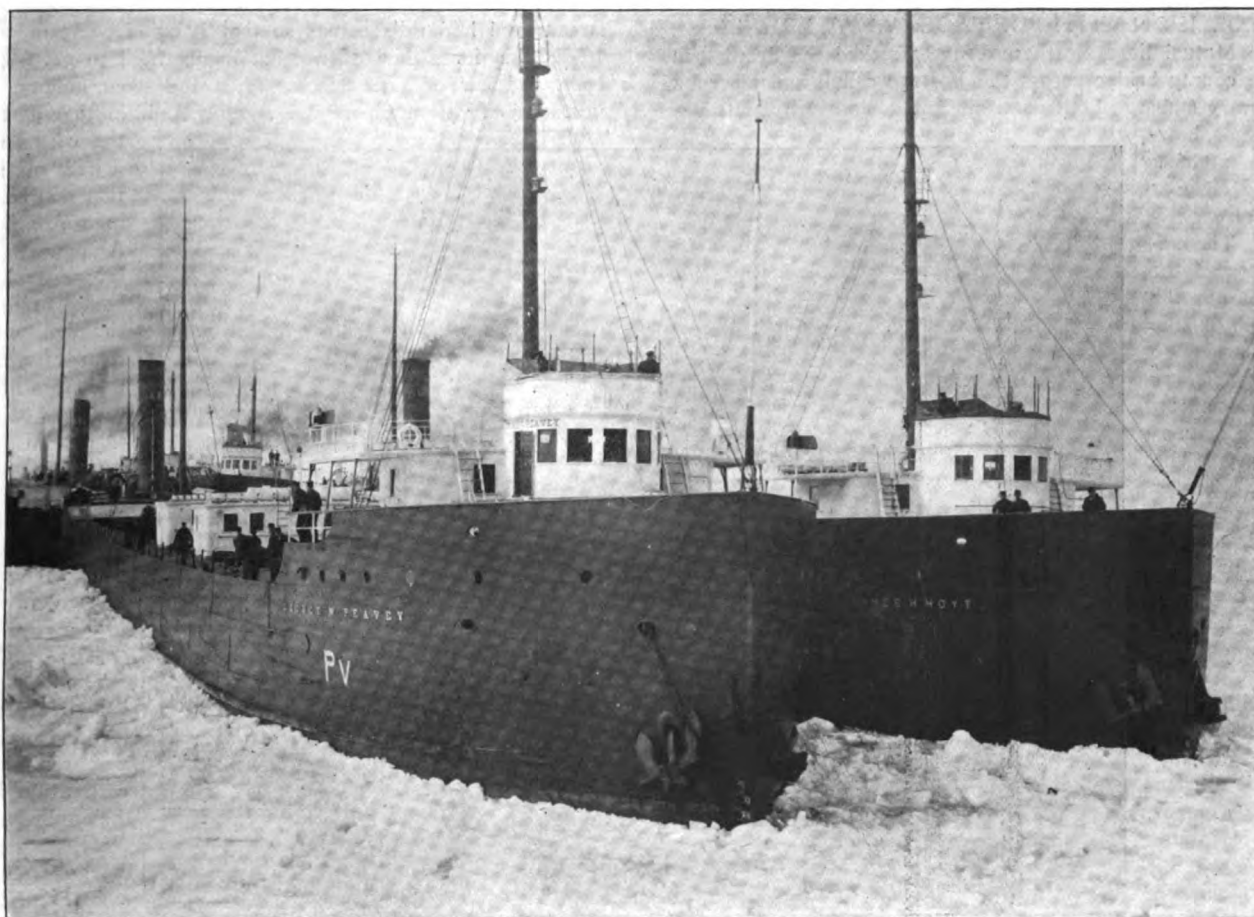
The season of navigation on the great lakes may be said to have opened twice this year. It was natural on all sides

to desire an early movement owing to the fact that a prodigious quantity of both coal and ore is to be moved. Accordingly vessels ventured out before the channels were clear of ice



THE ICE-LOCKED ORE FLEET—SHOWING THE VICISSITUDES OF EARLY SPRING NAVIGATION.





INVOLUNTARY PRISONERS FOR TEN DAYS IN WHITEFISH BAY.

but under ordinary weather conditions they should have had no trouble in navigating the channels. The weather, however, remained steadily cold and in addition the winds piled the ice in the channel and especially about Sault Ste. Marie. The result was that a hundred vessels were imprisoned, some of them for as long a period as two weeks. President Harry Coulby of the Pittsburg Steamship Co. ordered the ice crushing steamer Algomah to assist in breaking a channel through the ice in Whitefish bay and later sent orders to pay all hands off on all vessels in port except mates, engineers and cooks. This was prompted by the fact that the ice lay in solid masses for nearly twenty miles around Sault Ste. Marie. The Algomah finally succeeded in making a passage and in releasing the imprisoned vessels and a rush was made for the ore ports at the head of the lakes. Vessels in port, however, did not follow this lead because there were indications that the channels might close again. In point of fact the trip to Lake Superior has not been popular since the season opened, owners preferring if possible to send their boats to Lake Michigan, the straits being reasonably free from ice. The modern steel carrier is not in any sense an ice crusher, suffering far more in ice than wooden vessels and a number of them have been more or less damaged. Repair bills will probably foot up to a considerable figure, which, together with operating expenses is expected to reach an aggregate loss of nearly \$1,000,000.

Meanwhile the freight market is, of course, unusually quiet and little chartering is being done. Nothing is being done in grain either at Chicago or Duluth. The grain rate dropped to  $1\frac{1}{4}$  cents in corn at Chicago with no charters reported; and the wheat rate at Duluth is nominally  $2\frac{1}{4}$  cents.

The April ore movement which was expected to be considerable will, of course, be immaterial, and Lake Erie docks will be fairly bare of ore on May 1, that is to say they will

probably contain about 2,400,000 tons of ore. Ore is going freely forward to the furnaces, about 1,000,000 tons having gone in March and the April movement will probably be heavier yet.

#### NEW COAL DOCKS AT HEAD OF LAKES

Two or three other coal docks are in the air, and may materialize, though scarcely this year. One of these is for Jones & Adams, who have recently sold their docks to the coal combination. The Philadelphia & Reading Coal & Iron Co. has bought a tract on Connors Point, adjoining the former Jones & Adams dock, with 514 ft. front and 1,200 feet deep, and will improve it some time in the future.

Doubtless every dock to be built at the head of the lakes hereafter will be equipped electrically from the works of the Great Northern Power Co. This company is getting on famously in its work at the first storage dam and the canal and forebay, and will have water on some time next year. It is letting contracts for 1,500,000 ft. of western fir timber for staves to the pipe line down the hill, and the magnitude of the enterprise can be better understood when it is realized that this amount of timber is required for the upper portion of three conduits that carry the water from the forebay to the wheels. The lower portions of the conduits will be of steel. The company has placed orders for all its machinery and every contract requisite for the completion of the first installation has now been let.

The steamer Frontenac received serious injuries in the ice at Sault Ste. Marie. Twenty-four frames were broken and one plate cracked.

The first steamer to reach Chicago from the lower lakes was the steamer E. M. Peck from Buffalo with a cargo of coal.

### COLLISION WITH PORTAGE CANAL BRIDGE

The Mutual liner Northern Wave wrecked the draw span of the county bridge across the Portage canal, and placed a temporary embargo both upon navigation and railroad traffic.

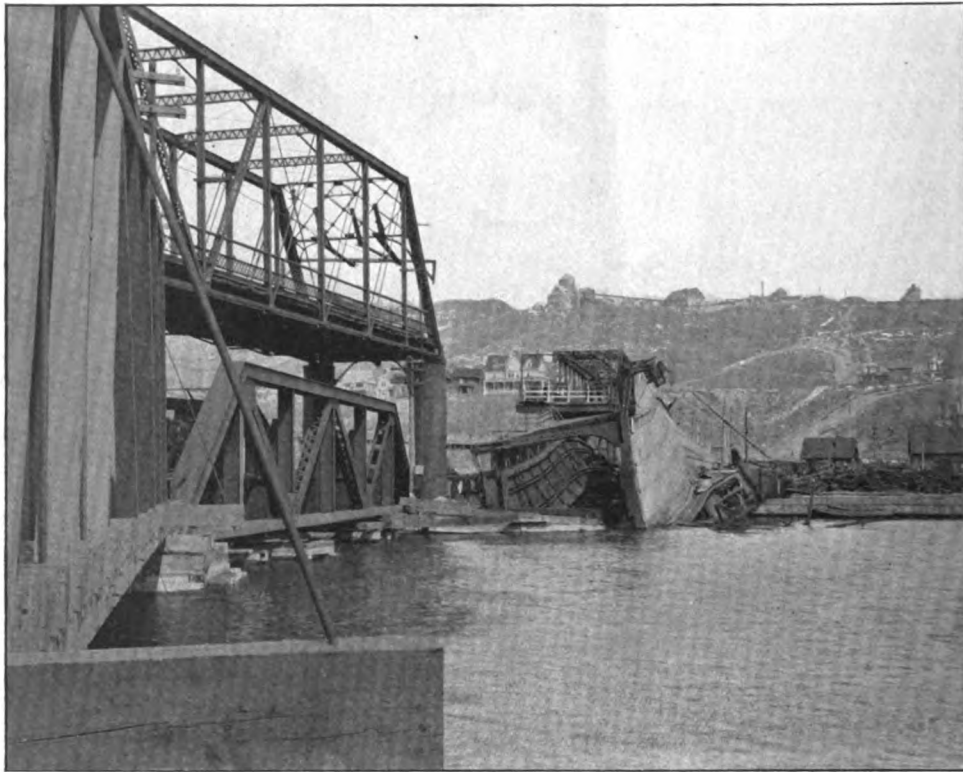
No blame, however, attaches to the steamer for the accident. The accident was the result of the failure of the machinery to act properly as the Northern Wave approached. The bridge tender tried to open the draw, the vessel proceeding at the usual speed under such circumstances. When the bridge tender discovered that it was impossible to open the draw on account of some derangement of the machinery he started to close it again but it was then too late for the vessel to lessen her momentum and she struck the draw broadside. The Northern Wave was eastbound and the illustrations show the draw as it lay over on the side hanging to the center pier. The railways interested made a contract with the Wisconsin Bridge & Iron Co., by which the latter was to get the passage clear in seven days, and this work has now been done, and the south side of the draw pier is open. The rest would be but for a second accident. As soon as the bridge was tipped over and the passage of trains stopped, the Duluth, South Shore & Atlantic set a few scows in the

stream and laid rails across so that it could get cars over. It did this for a day or two, but finally tried to get a long train and car of rails across, when the scow holding the northern end went down and is now sunk in that part of the channel.

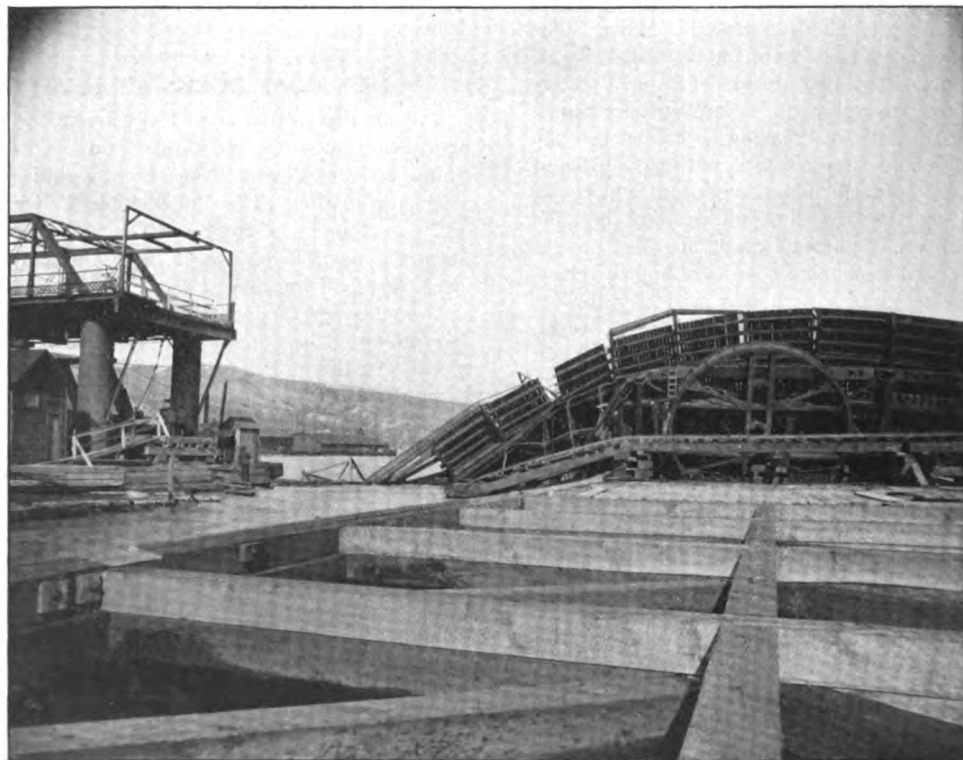
This obstruction will be out in a few days. A new draw-bridge will be built for the channel, wider than the old and it will be erected this spring. At present an improvised car ferry is used by the road and a municipal ferry for passengers

### EXPLOSION

The Dominion government is now making a searching investigation into the explosion of acetylene gas on the government steamer Scout whereby four men lost their lives. The explosion was so terrific that all the windows in the buildings in the vicinity were broken and the inhabitants of the village of Cape Vincent feared that the whole town of Kingston had been blown up. The accident occurred during the filling of three acetylene buoys which were on the dock being filled from the steamer lying alongside. The gas from the steamer catching fire her upper works were speedily burned away and her inside became like a roaring furnace. At the time of the accident two men were engaged in painting the buoys and they were literally blown to pieces. George Les-sard, the chief engineer of the



THE DRAWBRIDGE LYING OVER ON ITS SIDE.



LOOKING SOUTH INTO THE BRIDGE.

scows in the

lives. The explosion was so terrific that all the windows in the buildings in the vicinity were broken and the inhabitants of the village of Cape Vincent feared that the whole town of Kingston had been blown up. The accident occurred during the filling of three acetylene buoys which were on the dock being filled from the steamer lying alongside. The gas from the steamer catching fire her upper works were speedily burned away and her inside became like a roaring furnace. At the time of the accident two men were engaged in painting the buoys and they were literally blown to pieces. George Les-sard, the chief engineer of the

steamer Scout at the coroner's inquest stated that the acetylene gas was manufactured aboard the steamer. The captain or mate looked after the gauge and when the tank was full the men watching it signalled to shut off the supply. A second gauge on the pump kept the chief engineer informed of the pressure. The tank which was being loaded was only about half full. It had six atmospheres in it and to fill it it requires twelve atmospheres. The first tank was filled at one o'clock and about three o'clock work was begun on the third. The chief engineer was instructed to put twelve pressures in the buoys which had been in use three years. He examined the first and second tanks after they had been filled and found that the connections had been properly made.

The board of inquiry into the affair consists of Edward Adams, chairman of the board of steamboat inspectors, Ottawa; John Dodds, boiler inspector, Toronto; and J. Thompson, boiler inspector, Kingston. Their inquiries will be most exhaustive as it is the desire of the marine department to get at all the facts.

George T. Merwin, agent of the manufacturers of the buoys stated that a pressure of fifteen atmospheres had been put into the buoys. No guarantee of pressure he said was ever given by the manufacturers as to what the buoys would stand. In his opinion they were safe with a pressure of fifteen atmospheres. Mr. Merwin stated that if the company had been required to give a guarantee that the buoys would stand certain pressure with safety they would have taken steps to inspect the buoys and give them a certificate for a limited time, the same as is done in the case of steam boilers.

The buoys were 7 ft. 6 in. in diameter, built of 9-16 in. to 12-16 in. steel with welded ends, the latter being almost flat and it is intimated by some experts that they were never meant to carry 180 lbs. pressure.

Capt. James F. Fraser, commissioner of lights, who has general charge of all aids to navigation, with special reference to their operation and maintenance, including the different gas buoy services of the dominion, gave scientific evidence of value. He has been in charge of the service since 1893 and has never known of a case where a buoy burst as these apparently did. In reply to questions from the coroner and jury, he stated that there is no objection to filling these buoys on docks and this has been the practice. The pressure of the gas in the buoys when filled, varies from 180 to 225 and it has been the custom to charge to the minimum pressure. The practice has been to accept the maker's test for buoys both in Canada and other countries.

The manufacturers who supply these compressed gas buoys state that they may be used to 150 or 180 lbs., working pressure, leaving a further margin of safety, for higher charges. The witness understood that the crew of the Scout had filled the two red buoys to a pressure of 180 lbs. and these had been filled for about half an hour before the explosion took place. The accident, he said, did not occur in the compression, manufacture or pumping of the gas. There is a gauge near the man-hole of each buoy and another at the compressor, both being carefully watched so as to guard against accident from excessive pressure, and to tell when the buoys are filled. He had believed at first that the explosion was due to a defective weld, in one of the red buoys, and personal examination served to confirm this view.

He placed on exhibit a piece of cast iron, supposed to be a section of the exploded buoy, which was found on the deck of the Scout shortly after the explosion. The piece was found by H. Youlden, proprietor of the Kingston foundry. The witness drew a diagram explaining to the jurors the dimensions and construction of the buoy. The body of the buoy consists of one sheet of cast iron welded longitudinally. The piece produced in court he claimed to be a section of the welded portion, in which he pointed out a flaw in the welding which, in his opinion, caused the explosion. All of these

buoys have been in the service of the marine department since 1901, being used every year and always charged up to 180 pounds or more when in use.

He considered that this explosion had occurred at that pressure. There is no yearly test of these buoys, excepting the service test to which they are subjected while in use, as no special test has ever been considered necessary. The buoys are scraped and painted each year and if no external corrosion or dents are found, they are considered all right as the acetylene gas has no chemical or other effect on the metal of which the buoy is constructed. Under the same conditions if the buoys had been charged with oil, gas or compressed air, a similar explosion would have occurred. Lighting the gas in the cage of one of the red buoys could not possibly have caused the explosion as in that case the gas would simply have burned out, as evidenced in the case of the black buoy which was partially charged and the gas in which simply burned out without explosion.

There is, said the witness, no case on record where a cylinder of acetylene gas ever exploded spontaneously. These explosions are caused by defective generators. He did not consider acetylene gas dangerous, and was well acquainted with its properties. He explained the manner in which the gas is manufactured on the boat and led through tubes to the buoys. When the gas is generated by the action of the carbide and water, it is led over a dryer to remove moisture and impurities. It then goes into a compressor where it is gradually compressed through three stages, so as to avoid heating, thence through another dryer and cooler to the buoy, through the receiver at the man-hole, where one of the gauges is kept.

The Donnelly Salvage & Wrecking Co. was given the contract of raising the Scout. Considerable difficulty was experienced in doing this, owing to the fact that the port holes in the hull of the steamer were open. The hull was so crowded against the dock that the diver could not cover over the port holes from the outside and the steamer was so full of machinery that in many places the diver could not get at the openings on the inside. However, the job of raising her was successfully completed on Sunday afternoon.

### PERSONAL

Mr. E. T. Williams, manager of the Lake Superior Contracting & Dredging Co., has retired from the active management of the company and has been succeeded by Mr. J. C. Hubner. Mr. Williams, however, retains his financial interest in the company. He is a widely known figure in great lakes circles and he has been identified with river and harbor improvement work on Lake Superior since 1858. He dredged the channel from Keweenaw Bay to Houghton in 1860 and the old propeller General Taylor was the first boat to make use of it.

Capt. George B. Horn, who has sailed on the vessels of the Detroit, Belle Isle & Windsor Ferry Co.'s fleet since 1878 has resigned to accept the position as master of one of the Michigan Central Railroad's ferries. Capt. Horn has been a master since he was twenty-one years of age.

Mr. Charles Ducas, formerly editor of the Railroad Gazette, has become associated with Ray D. Lillibridge in the business of technical publicity at 170 Broadway, New York city.

Capt. D. A. Hall, commander of the revenue cutter Tuscarora has been made superintendent of construction for the lighthouse service with headquarters at New York.

After a European trip of three months Capt. and Mrs. W. B. Rodgers, of Pittsburg, returned last week. Capt. Rodgers is president of the Rodgers Sand Co.

Major W. L. Fisk, government engineer who is in charge of the lake survey, with headquarters at Detroit, will be transferred to the Philippines.

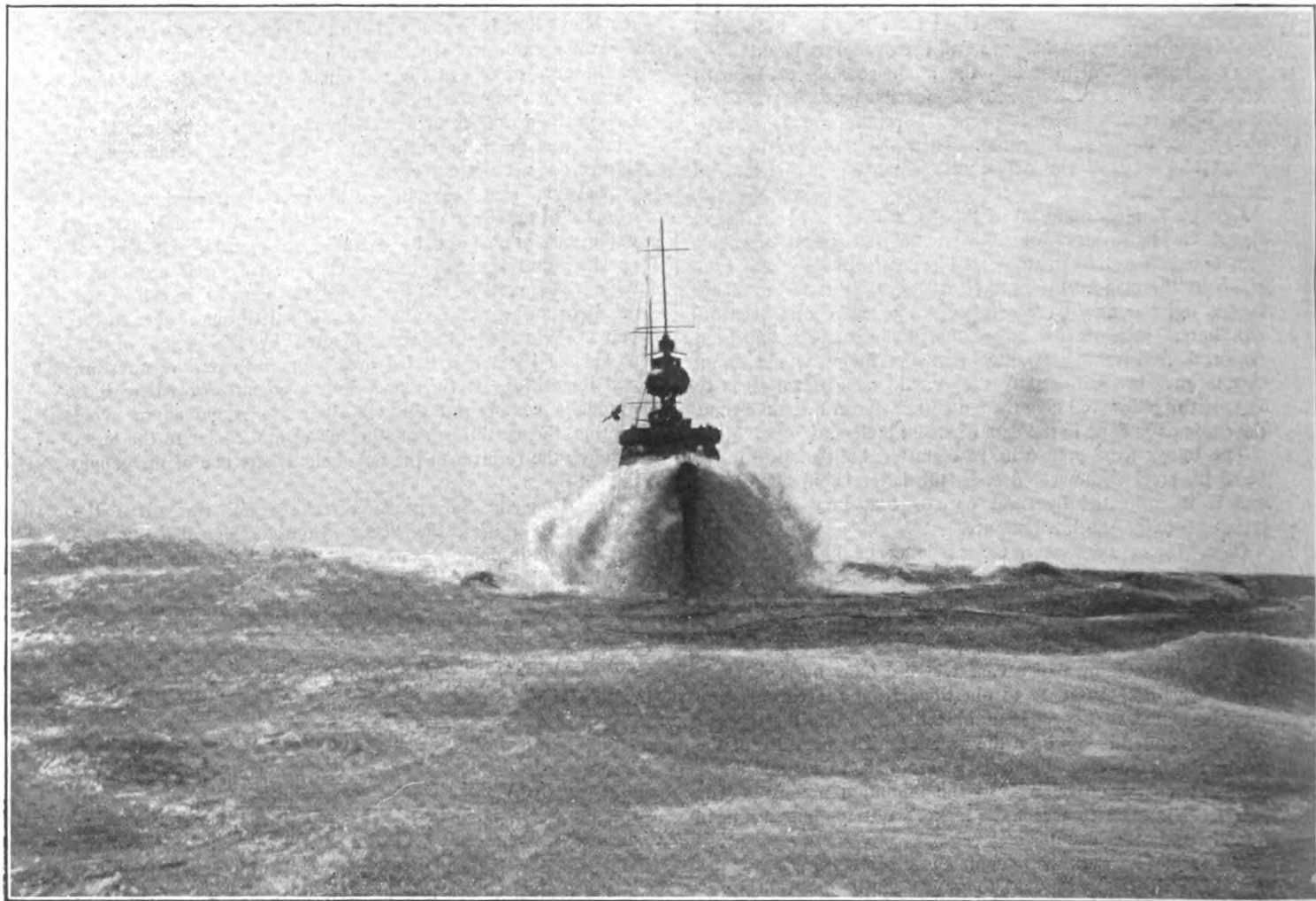


**FRENCH CRUISER CHARLEMAGNE**

The photograph which we reproduce here and for which we are indebted to the Engineering Times of London, represents the French warship Charlemagne at the moment when the front of the vessel rose from pitching, in which her forward deck was covered by the waves. The water that rose may be seen falling into the sea in a considerable quantity. The photograph will enable those who are not familiar with the sea-going conditions of warships a very exact idea of life afloat. At the moment when the photograph was taken

spring business and was beginning to think of shortening force when this windfall developed. At once business begins to look fine and it may last a considerable time.

As to the expensiveness of the start the lake man who set the figure at a quarter of a million dollars is pronounced here to be very short of the mark. An experienced lake man says that if the cost of delay and the running expenses while idle in the ice are all thrown in it will foot up a round million at the least. He is a trifle anxious to know who was the genius who set the vessel owners crazy and got them all start-



FRENCH CRUISER CHARLEMAGNE IN A HEAVY SEA.

the weather was exceptionally bad. The portion of the sea between the vessel photographed and the stern of the vessel from which the photograph was taken is relatively calm, because it is in the track of the *Matelot d'avant*, but at port and starboard, one can form a good idea of the elevation of the waves. These French ships are so powerful that they are able to attain, even in such seas, considerable speed. That, of course, is not without shipping a good deal of water, but their seaworthiness is very good indeed.

**AS BUFFALO VIEWS IT**

BUFFALO, April 25.—Of course they are all talking of the ice and rehearsing old experiences in that line, everybody regarding with something like horror the terrible expensiveness of the undertaking to gain a few days on the legitimate season by the premature start. There is, however, one very distinct exception to the rule and that comes from the shipyards, which will reap a harvest out of the misadventure. The Buffalo shipyard had about reached the end of its winter and

ed. That man ought to have some sort of medal bestowed on him that he must wear the rest of his life.

Still it will have to be confessed that the fever was more in the atmosphere than in the mind of anybody in particular and the experience will not teach anybody anything. There have been losses of the sort early and late from the time the lakes began to be navigated and the premature start was about simultaneous from Buffalo, Chicago and Duluth this time. It is related the captain of the steamer Winnebago, for instance, who took a cargo of lumber from Boyne City for a Georgian Bay port, was notified by the shipper that it would not be any use in trying to get through yet, but the steamer made the effort, only to get fast in the ice and lie helpless like the others, but so far out of the regular routes that she must depend mainly on her own resources to get free or wait till the ice melted.

The rain storm of the middle of last week seems to have helped the fleet outside of Buffalo considerably, though it was also much assisted by the shifting of the wind. The merest



landsman well knew that there had so little ice gone down the Niagara that it must be very heavy still in the lake and that a good down-lake wind would make navigation impossible till the ice was much thinner than it was. If there was any real demand for early freight movement by lake the excuse for the start would be apparent, but such is not the case.

They say, too, that there is prospect of a lot of difficulty from wet cargoes of grain, as the injuries to the vessels are above the tank tops and cannot fail to have let water into the holds of the vessels. This will be a new thing in steel bottoms, for if they have produced a revolution in any direction it is in carrying grain dry. In the days of the wooden bottom there was always a large contingent here of wet-grain merchants who sometimes made a lot of money from this traffic. The grain is mostly thrown on the hands of the insurance companies and they, having no means of taking care of the grain, have to sell it to the lowest bidder.

Of late this industry has languished, so that the men belonging to it were fairly discouraged. Their business had mostly slipped away. This late winter and spring they had done something in hot corn that came in by rail. Somehow the western corn has not dried out well this year and if the spring had turned out warm there would have been great losses from it already. It has come in out of condition to a considerable amount as it is and it is doubtful if it can be moved to any extent by lake or canal on that account.

The canal boatmen, what there are left of them, are looking for quite a season, though it is mostly on account of their very small numbers. Their faith is, as usual, sufficient, and there seems to be reason for it now, as the active opposition to the work of enlargement is past, to all appearance. The state authorities are letting the work in quantity and last week the first contractor began operations. There will be many of them active in a short time. They, too, are of the hopeful sort, having forgotten the plight the former canal-improvement undertaking left them in. With a great part of the contracts unfinished the work was suddenly stopped and it took so long for the matter between the contractors and the state to come to an understanding that most of them lost heavily and some of them were ruined.

After all it is a great problem still. The idea of enlarging the canal for the benefit of the grain trade has been laid aside as quite a small matter. The new fleet will carry four times as much to a cargo as the present one does, so that it will take other business besides grain to satisfy the traffic. We look for iron to do this and feel confident. Too bad that the undertaking was delayed so long. They say there are less than 500 canal boats now, when there used to be 7,000.

JOHN CHAMBERLIN.

#### ITEMS OF GENERAL INTEREST

J. W. Hawley, Bath, Me., launched a four-masted schooner last week. She was christened by Miss Marion Drisko, of Fairfield, Me.

The Memphis & Vicksburg Packet Co., Memphis, Tenn., will build a new steamer to replace the Delta. The steamer will be 225 ft. long, 40 ft. beam and 8 ft. deep.

The Montreal & Lake Superior Navigation Co. has given contract to the Caledon Ship Building Co., Dundee, Scotland, for the construction of a 3,000-ton steamer for great lakes trade.

The new Hamburg-American Line steamship Amerika was launched last week at the plant of Harlan & Wolff, Belfast, Ireland. She is intended for intermediate service between Hamburg and New York.

The Heffernan Engine Works, The Puget Sound Engine Works and the Moran Bros. Co. all of Seattle, Wash., have been awarded orders to do repair work on the geodetic survey boats Gedney, McArthur and Patterson.

Wm. E. Woodall & Co., Baltimore, Md., have launched a new

lighter for the Chesapeake Steamship Co. and are now engaged upon the construction of a tug for the same company, of the following dimensions: Length, 73 ft.; beam, 17 ft.; depth, 8 ft. 5 in. The E. J. Codd Co. will build the engine, boiler and other machinery.

Several changes have recently been made in the assignments of naval officers detailed for inspection service at ship yards. Capt. W. H. Beehler, has been relieved from inspection duty with Cramp's and the Neafie & Levy Ship & Engine Building Co. at Philadelphia, but continues his duties at the New York Ship Building Co. at Camden, N. J.

Capt. J. T. Newton has been detailed to additional duty as general inspector of equipment of vessels building for the navy at the Cramp yard and the Neafie & Levy plant. Lieut. Com'dr. W. G. Miller has been detailed to Philadelphia for duty as assistant to the inspector of equipment at the Cramp company's plant and the yard of the Neafie & Levy company.

A floating target, the first of its kind to be constructed, was launched last week at the Brooklyn navy yard. The target is in the shape of a steel box 32 ft. deep, 12 ft. long and 12 ft. wide. It will be ballasted so as to stand up 9 ft. in the water, leaving exposed 12 ft. of its depth, the ordinary freeboard of a battleship. It is designed for use in determining the proper efficiency of heavy ordnance against battleship armor.

The Monongahela River Consolidated Coal & Coke Co.'s tow boat Joseph B. Williams reached New Orleans last week from Pittsburg with thirty-four barges containing 782,000 bu. of coal. The barges were of new design having a capacity of 7,000 bushels greater than the old style boats. They were constructed as an experiment, the object in view being to reduce the number of boats to be handled in a tow without lessening the carrying capacity.

The new passenger steamer Commodore built for Capt. George H. Terwilliger, Newburg, N. Y., was launched from the ways of the McCausland Ship Building Co., Rondout, N. Y., last week. She will be used as an excursion boat on the Hudson river and is 103 ft. 4 in. long, 24 ft. 4 in. beam and 7 ft. 6 in. depth of hold. The engines were built by the Poughkeepsie Foundry & Machine Co., Poughkeepsie, N. Y., and the boilers by the Kingsford Foundry & Machine Co. of Oswego, N. Y.

Marine men of New York are receiving very kindly the suggestion that a great centennial celebration be held in New York in 1907 to commemorate the first successful application of steam to marine propulsion. It was in 1807 that Fulton put the Clermont in successful operation on the Hudson river. Supt. A. R. Smith of the Maritime Exchange in speaking of it said that New York owes her position, her greatness, her vast population, her commerce, industries, and finance to her maritime position. He thinks, therefore, it is fitting that the advent of steam for marine propulsion should be fittingly celebrated by the greatest of American ports.

#### CANDLED ICE

Editor Marine Review.—Referring to paragraph on page 28 of your issue of the 13th inst., regarding "candled ice." As the term has been used in dispatches sent from this office I think it proper to explain its meaning. When the sun's rays strike clear ice it causes it to become honey-combed or candled, i. e. if there are several days of sunshine. It is easy to tell when the ice is full of holes by the disappearance of the water on the surface, which shows that it is weakened to such an extent that it will break under pressure of high winds or the passage of a steamer. The term is in general use in this section and the majority of vessel masters trading to Lake Superior understand its meaning.

ALEXANDER G. BURNS,

Sault Ste. Marie, Mich. U. S. Weather Bureau Office,

# Progress of our Merchant Marine

It is understood that the Merchant Marine Commission will arrange to hold additional meetings in May, probably in New York, to give shipping interests an opportunity to submit additional information to show why shipping in the foreign trade should be assisted by the government. While no pro-

to alter in general features the shipping bill drafted by the commission and submitted to the last session of congress, though it may be amended in detail. The bill is a very modest one and is calculated to disarm opposition.

In his remarks before the Merchant Marine Commission Mr.



PUTTING THE FLAG ABOARD.

[W. L. Evans in the Leader.

gram has been arranged and probably none will be, the commission will nevertheless hold additional hearings throughout the summer and the testimony thus secured will be presented in the form of a supplementary report to the three volumes already in existence. As far as is known there is no intention

R. P. Schwerin, president of the Pacific Mail Steamship Co., stated that he has no philanthropic ideas about the transportation business. He believes in making all that is possible for the stockholders of a steamship line, and that the same policy that has been applied to the United States navy would raise

the merchant marine from its present deplorable state to prosperity. The substance of his remarks was as follows: "The fundamental principle in the transportation business is economy of operation. The American laborer has been raised by protection to a middle class position and is too expensive to be hired by steamship companies to perform the work of a sailor. Free education, while highly beneficial, does not fit American boys for life on the sea. Thus foreigners fill the positions on board ship. With regard to the good American crews of which politicians talk it is a fact that the percentage of Americans sailing before the mast is deplorably small. On one of the Pacific Mail Steamship Co.'s vessels, only two of a crew of fifty-one could splice a knot or rope, and these two were not Americans. Efforts made to help young American boys on board ship usually end in failure. The boys are hard to discipline, and are inaccurate in clerical work. Before an American boy goes to sea he should receive training on a ship devoted to that purpose. The art of navigation must be learned on a square-rigged vessel. The Hamburg-American Line, subsidized by the German government, is carrying out this plan successfully. Every large coast city should have a training vessel, the course thereon taking three years. Thousands of American boys would be glad to go to sea.

"What we want is tramp ships which should be permitted to employ whatever labor is cheapest. The ships must be got first, no matter who mans them. The government should lend its aid primarily to direct mail routes, the ships of which are constructed so as to be of immediate use in time of war. This would aid not only the merchant marine but would be a profitable investment for the government. The subsidized ships, flying the Japanese flag have been taken over by the Japanese government and are now doing warlike service. Tramp ships should be assisted when they carry cargoes from ports at which none of the regular mail boats touch, and should be encouraged to seek ports that cannot be served by the regular line. The steamships *Siberia* and *Korea* were so constructed that they would be readily convertible into cruisers and so be entitled to the proposed subsidy. The difficulties of getting this done were great.

"When the Pacific Mail Steamship Co.'s vessels were operating under the postal subsidy act of 1891, the company lost money steadily, because the vessels were required to steam faster than they could under normal conditions. They burned more coal, damaged more boilers and machinery than the subsidy compensated for. When the contract with the government was cancelled, repair and coal bills became less and the company made a profit. Though the subsidy should be a general one, it should cover the cargo carried and not the mileage.

"The cost of operating ships with white (or European, as they are commonly called) crews, shipped at San Francisco at the regular wages, is from two to three times greater than with European crews shipped at foreign ports and under foreign flags. The cost of operating ships with Asiatic crews is even less than with European. This is why the Pacific Mail Steamship Co. carries Asiatics on its trans-Pacific lines. In work not requiring great strength, Chinese give better service than Europeans and their maintenance is much more economical.

"The *Korea* and *Siberia* cost in round figures \$3,700,000.00, and the *Manchuria* and *Mongolia* cost \$4,500,000.00. The same vessels could be built in Great Britain for 30 or 35 per cent. less, but, if they had been bought there, could not have obtained American register. Not long ago one of the big vessels of the Pacific Mail Steamship Co., the *Algoa*, ran on the rocks and suffered serious damage. The lowest bid for the repairs in San Francisco was \$93,000.00, while a yard at Victoria, B. C., agreed to do the work for \$42,000.00. The great difference was due to the high wages demanded by San Francisco workmen and the enormous docking charge,

which was \$30,000.00 in San Francisco as against \$6,000.00 in Victoria. In the end a local firm agreed to do the work for \$42,000.00 plus the estimated cost of taking the vessel to Seattle. On account of the exorbitant wages and dockage charges in San Francisco it is the custom of the Pacific Mail Steamship Co. to have its trans-Pacific liners repaired in Hong Kong, but there is no dock there large enough to hold the new vessels. Then, in clearing and painting new ships, the Chinese laborers do better work than the Americans.

"Difficulties and heavy expense confront those who would build ships in American yards; but great aid can be given by a progressive subsidy. Capital must be encouraged and ship yards as well as ship owners be protected and aided."

### CANADIAN SHIPPING NOTES

The Dominion government has fitted up submarine bells at the lightships at Red Island, White Island reef, and off the mouth of the Saguenary river, on the St. Lawrence river. During foggy weather the bell will strike the number of the lightship, viz.: 3, 5, or 7, as the case may be, with two seconds interval between each strike and 10 seconds interval between each time of striking. Vessels fitted with the receiving apparatus should hear the bell at five miles, and vessels not so equipped at about two miles.

The *Hazel B.* has been added to the Lake Nepissing fleet. She was built at North Bay, Ont., her dimensions being: Length, 65 ft.; breadth, 14 ft.; depth, 5 ft. The steamer will carry 150 passengers and will make four trips a week from North bay to French river, during the tourist season. A steamer for passenger, freight and towing service is under construction at Sturgeon Falls, and a dredge to improve the navigation of Sturgeon and South Rivers is also being built.

The Rainy River Navigation Co. has decided to cease running the *Keenora* on the river section of the route between Port Portage, and Fort Frances, owing to the increasing difficulties of navigation. The *Edna Brydges* will run on the river, and the *Keenora* on the lake. This will enable the company to better meet the competition from Warroad, Winn.

The establishment of a life saving and salvage steamer on the west coast of Vancouver Island is being discussed with the Department of Marine by Capt. Balcom, who recently brought the steam whaling brig, *Orio*, from Norway, where she was built.

The reported purchase of the steamer *Seguin* as a light-house tender, and of the *Manitou* for hydrographic survey work by the Dominion government, were somewhat premature, and neither purchase may ultimately be made.

Among recent deaths of marine men are Capt. James Scott, formerly with the Quebec Steamship Co., on its New York-Bermuda route at Arcadia, N. S.; Capt. H. B. McAllister, at St. John, N. B.

The Richelieu & Ontario Navigation Co.'s steamer *Belleville* (formerly *Spartan*), which has been lengthened 25 ft. at Kingston, has been completed and is expected to be placed on her route early in May.

The freight steamer *Nile* has been chartered by Jas. Swift & Co., to run between Kingston and Ottawa, calling at way ports, on the Rideau canal.

Pusey & Jones Co., Wilmington, Del., are installing boilers and machinery in the steamer *Quickstep* of the American Fisheries Co., which has just been lengthened 25 ft. on the marine railway of the American Car & Foundry Co., Wilmington, Del.

The German admiralty has accepted the new turbine-propelled cruiser *Ruebeck*. The contract for this vessel called for 22 knots, but the *Ruebeck* made 23 knots an hour on her trial trip of 180 miles from Kiel to Swinemünde.

### NEWPORT NEWS COMPANY'S PROSPECTS

Mr. W. A. Post, general manager of the Newport News Ship Building & Dry Dock Co., Newport News, Va., talked very interestingly concerning shipping conditions some time ago. Discussing legislation he said:

"The men representing the shipping interests in this country are not a set of back-door beggars, hanging around the capitol with outstretched hands, asking alms of Uncle Sam, as some persons have been wont to picture them. They are business men who simply ask that conditions be equalized—that we be placed on a parity with the foreign ship owner and ship builder, so that we may successfully compete for prestige upon the seas and save to the United States the enormous sum of nearly \$200,000,000 we now pay out annually to the foreign ship owner for taking our products to market. They ask for protection—the application of the principle that is applied to other industries of the country. If Great Britain, France and other powers can, with profit, subsidize ships flying their flags, France and other powers can, with equal profit, protect and foster so important an industry, especially as every other industry is protected.

"Neither the American ship owner nor ship builder asks that the wages of the workingmen they employ be lowered to the level of the foreign mechanic engaged in similar work, but they do ask that legislation be put into effect that will equalize conditions and put them on a fair competitive basis. Until this is done capitalists are not going to put their money into American ships, save in the coastwise trade which is amply protected by our government and is a profitable investment.

"When at the last session of congress the Merchant Marine Commission, composed of Democrats and Republicans, was appointed to inquire into the condition of our shipping in the foreign trade and report what legislation is required to restore it to its former position, we adopted a course pursued by England. Everywhere the commission held hearings men representing nearly every walk in life appeared and appealed to the members to legislate favorably in the interest of shipping to guard this interest as jealously as it has fostered other industries. So, in slang parlance, 'it is up to congress.'

The Newport News Ship Building & Dry Dock Co. will pursue its usual policy and endeavor to hold its own, as it has done in the past; but it cannot hope to secure any large contracts for new merchant work except perhaps an occasional contract for a coastwise vessel, until the government shows a willingness to aid in establishing a merchant marine that can be operated on a paying basis, for American capital will not seek an unprofitable investment.

"Equipped as it is with modern machinery and unlimited facilities, the ship yard here could, after the first year, build and deliver merchant vessels of 5,000 tons at the rate of ten a year; and it is therefore reasonable to assume that if a demand is created for merchant vessels Newport News will enter upon an era of business activity the like of which it has never before known, for to operate the plant at its full capacity would require the employment of from 10,000 to 12,000 men with the consequent benefit to our merchants which would result from this greatly increased force.

"With its facilities for quickly turning out repair work the Newport News Ship Building & Dry Dock Co. will attempt to further extend its operations in this direction. During 1904 the total number of vessels repaired here was over 600—an average of two vessels for each working day. Having two large dry docks in operation the company is enabled to carry on this work on an extensive scale. Here any ship now afloat, no matter how large, can be docked. Ship owners all over the world have come to recognize the unequalled facilities at Newport News for executing repair work, and hence when their vessels are in this vicinity they are sent here to be repaired."

### AROUND THE GREAT LAKES

Vessels sent to Waukegan this year will be given tug service by the J. L. Hackley of the Chicago & Great Lakes fleet. The Hackley is already at Waukegan.

The propellers F. B. Squire, W. R. Mack and Lewiston were the first of the Chicago grain fleet to reach Buffalo. The steamers had a rough trip down the lakes.

The Lake Superior Contract Dredging Co. of West Superior has been awarded a contract for dredging 89,000 cu. yds. of sand, gravel and riprap for the trench for the easterly half of the new south pier at the Superior entry.

A satisfactory agreement has been entered into between the Great Lakes Towing Co. and the Hacket Wrecking Co. of Amherstburg, and there will be no competition on the Detroit river this season in the wrecking business.

H. J. Pauly of Milwaukee who recently purchased the steamer Harlem from the Jenks Ship Building Co. of Port Huron, says it is his intention to lengthen the Harlem 72 ft. next winter. He will also shift her boilers and engines aft.

The Hackley Transportation Co. of Waukegan, Mich., has been organized with a capital stock of \$100,000 to operate the steamer Charles H. Hackley formerly of the Barry Line. Thomas Hume of Muskegon is president of the company. The Hackley will run between Chicago and Muskegon.

What was formerly known as the old Cleveland Ship Building Co.'s yard at Cleveland was sold this week by the American Ship Building Co. to the Erie Railroad for \$46,750. The space includes 401 ft. front on River street and it is understood that it is the intention to use the property for coal docks.

The schooner Racine, belonging to the L. P. & J. A. Smith Co. of Cleveland, sank off the end of the south quarry docks at Kelley's Island this week. The Racine in attempting to turn around to load on the other side nearly capsized. She filled with water rapidly and is now lying in nearly 30 ft. of water.

The first steps towards making Wolf Lake, Ind., a rival of Indiana harbor for shipping business in the upper end of Lake Michigan were taken last week when the Knickerbocker Ice Co. of South Chicago, made a contract with the Great Lakes Dredge & Dock Co. for the dredging of an inlet to Wolf Lake from Lake Michigan. The little lake is connected with a bigger one by a stream 300 ft. long.

The Great Lakes Engineering Works, Detroit, has secured the contract to overhaul the twelve whalebacks sold by the Pittsburg Steamship Co. some time ago to Mr. Benjamin Boutell of West Bay City, representing eastern purchasers. The changes are minor in character but are intended to make them more efficient for ocean service. The whalebacks are bound to Chicago with coal and their final lake cargo will be grain from that port to Montreal.

The sailors, as a rule, are reluctant to open the season of navigation on Friday, but last week the Pittsburg Steamship Co. in double defiance of its old superstition, ordered thirteen of its steamers to leave the port of Milwaukee on Friday last. They steamed slowly out of the harbor then formed in battle line and gave a salute preparatory to the trip to Escanaba for ore. The steamers were the A. B. Wolvin, Coralia, Cambria, Griffin, Malietoa, Mariska, Maritana, Roman, Mather, Fairbairn, Palmer and Wawatam.

The Lehigh Valley package freight steamer Bethlehem, bound for Chicago, took a sheer into the Gilchrist steamer Saturn abreast Parsons Island last Saturday morning and both steamers were beached, the Saturn at Parsons Island and the Bethlehem at Walpole. The package freighter's steering gear went wrong as the boats neared each other, the Bethlehem striking the Saturn on the starboard side between the fifth and sixth hatch, breaking several frames. An examination proved that the Saturn was not as badly damaged as was supposed and she will complete her present trip before going into dry dock.

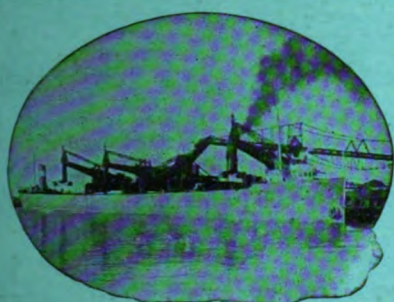




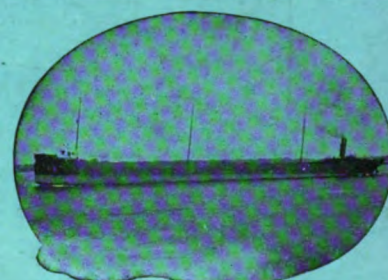
VOL. XXXI.

CLEVELAND, O., APRIL 27, 1905.

No. 17.



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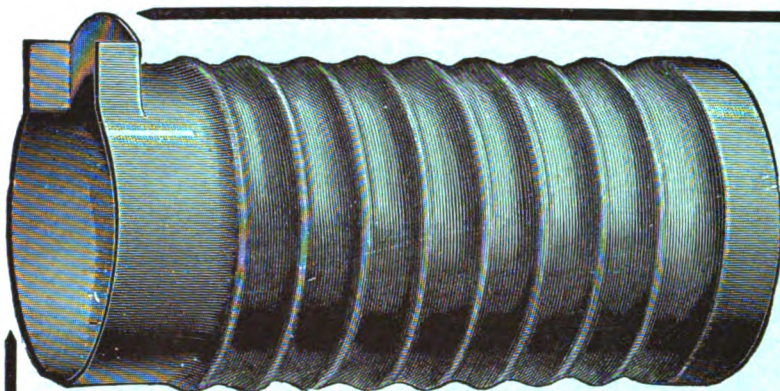
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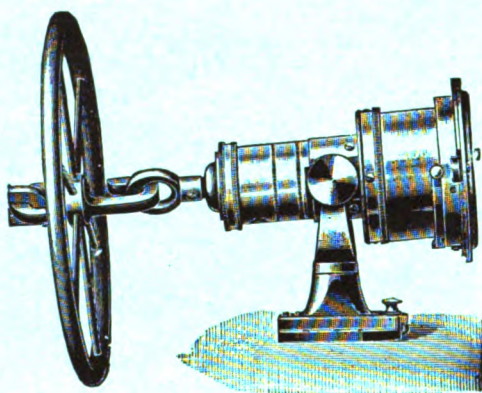
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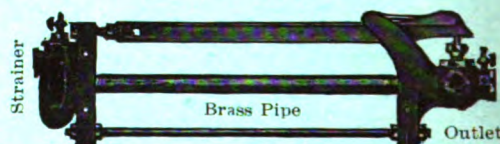
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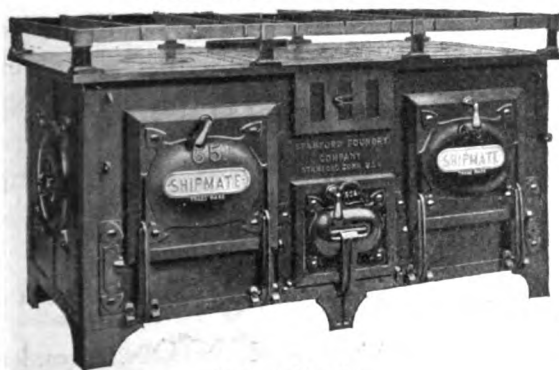
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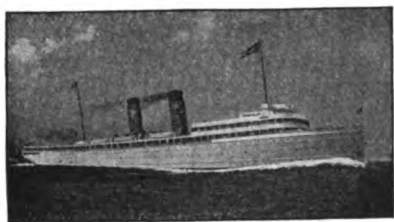
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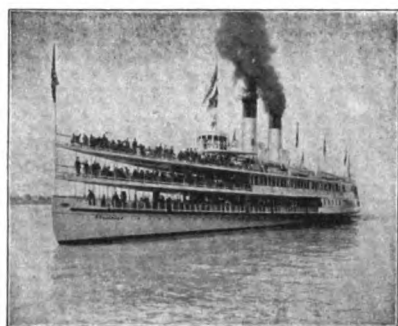
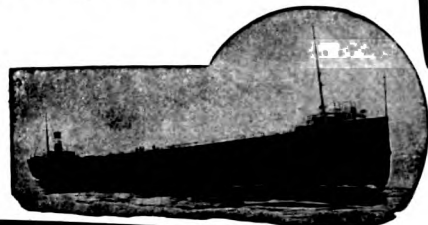
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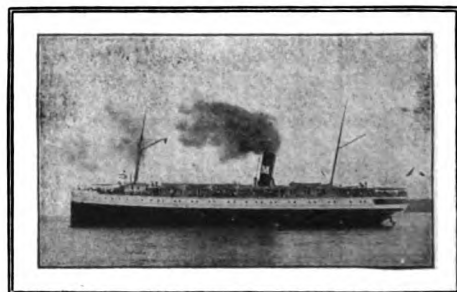
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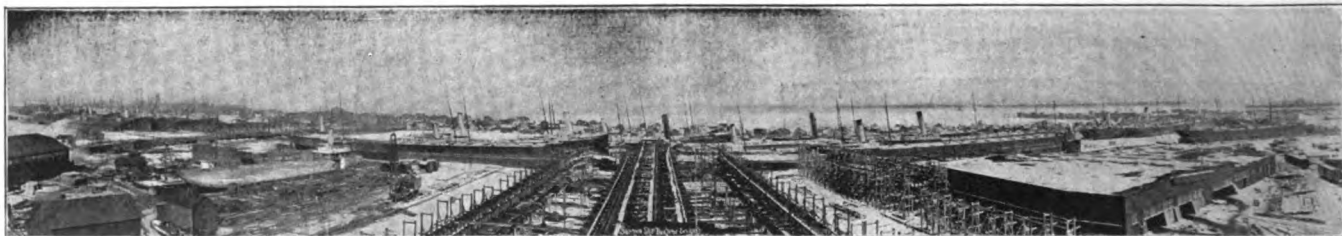


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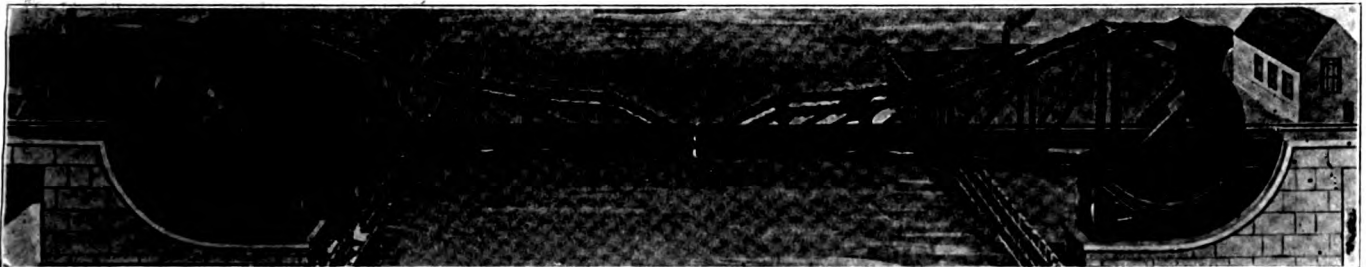
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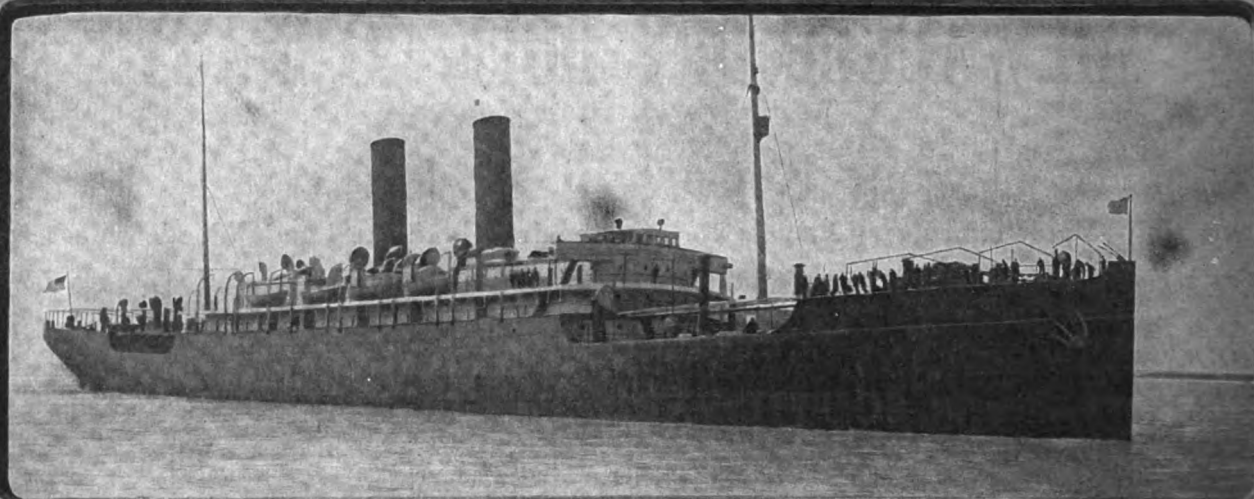
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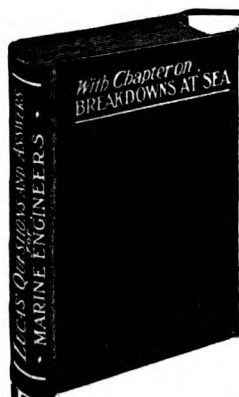
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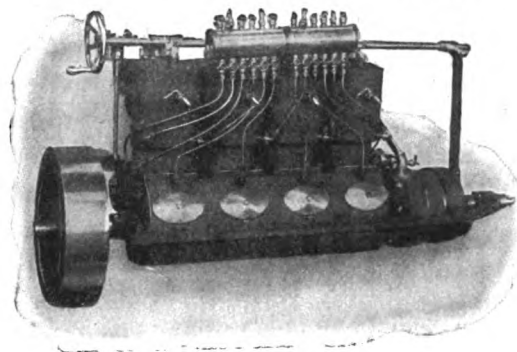
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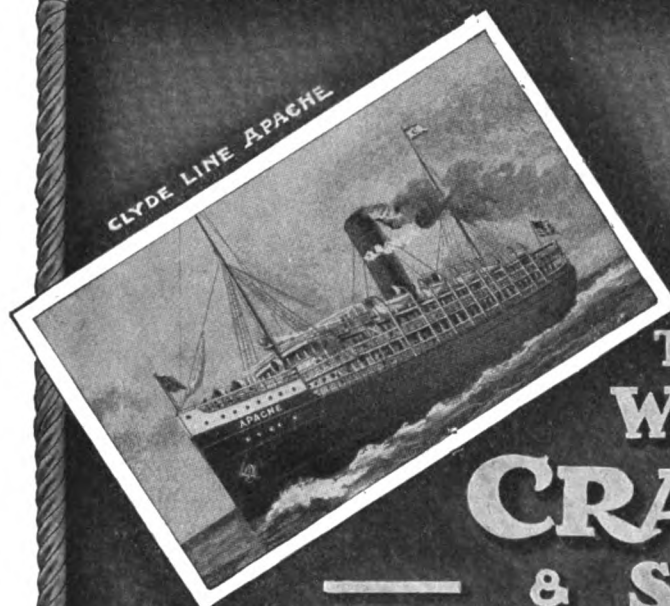
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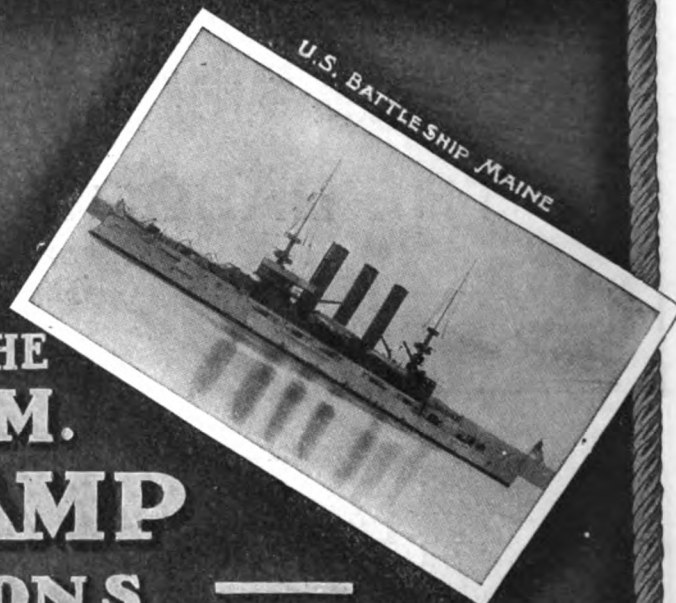
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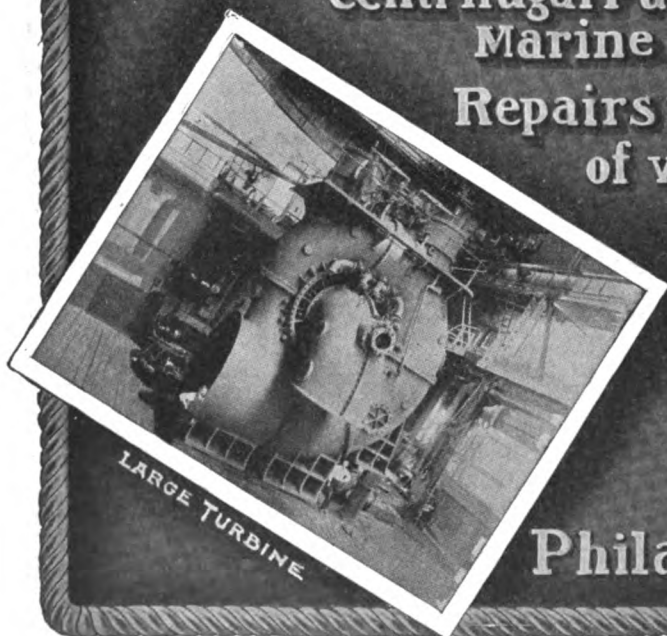
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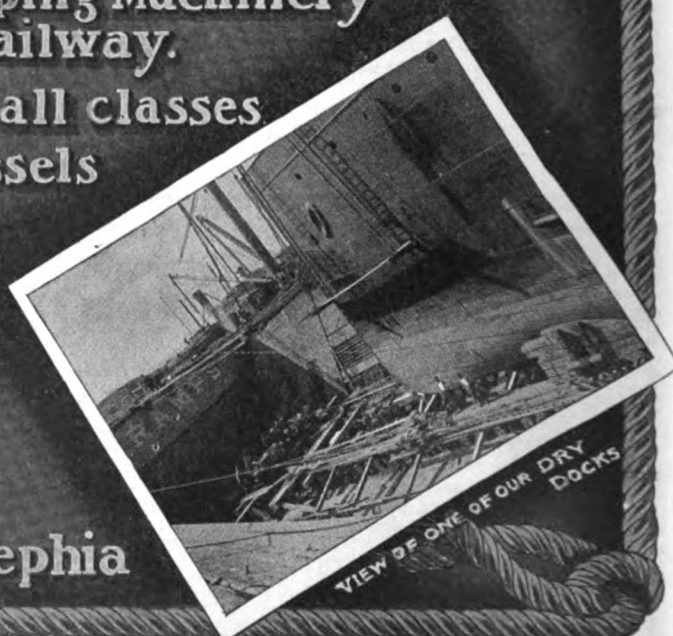
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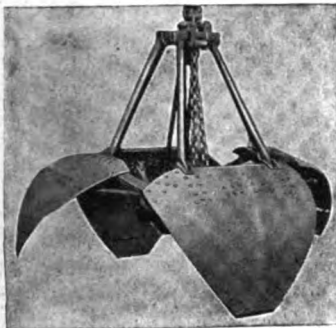
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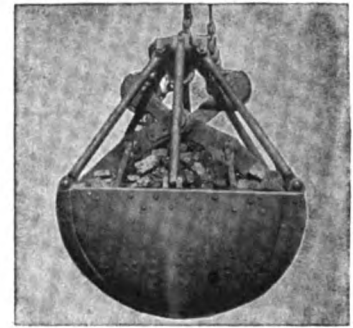
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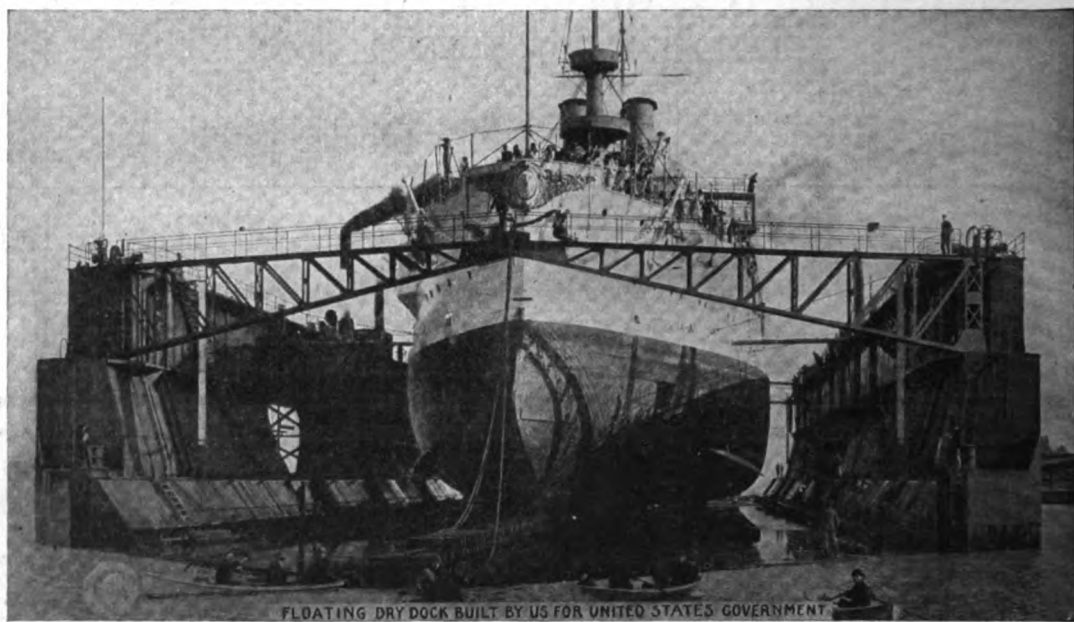
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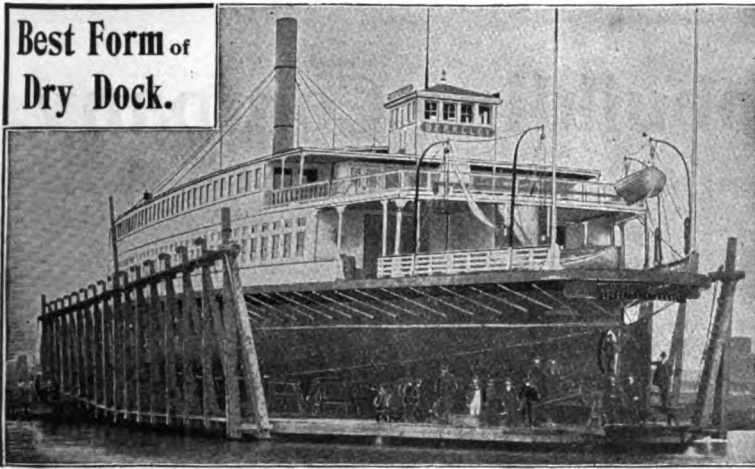
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Best Form of  
Dry Dock.



## CRANDALL'S MODERN MARINE RAILWAYS

**SAFE AND RAPID**

Built of Steel or Wood  
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Generators of the Highest Quality of Steam  
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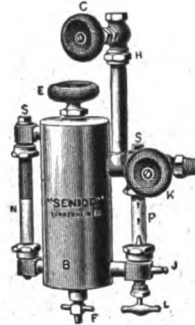
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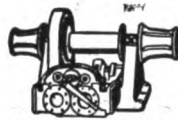
26 Cortlandt Street, New York.  
35 Great Dover Street, London.

104



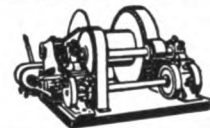
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Suitable for all Boats from 3: to 200 HP.  
Over 100 in successful use.  
Also the well known and always  
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Of all kinds and sizes, and  
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for ship use.  
Docking and Hauling Engines  
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Somewhat the cheapest, and  
altogether the best. Positively  
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**SHIPS — ENGINES — BOILERS**  
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Launch of "Mongolia," Pacific Mail S. S. Co., July 25, 1903.  
615 feet long, 65 feet beam, 51 feet deep.

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**Repairs done under shelter.**



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in less time—in less space—with  
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### Acme Cork Life Preservers

which we unhesitatingly recommend as the most efficient, durable and economical preservers manufactured.

The blocks are made of compressed cork and contain no admixture of any foreign substance whatever.

The canvas, straps, thread and workmanship are of the highest possible standard and are in strict accordance with the government regulations.

The tests of the Armstrong Acme Preserver before the Board of Supervisors in Washington were the most severe ever made and demonstrated their great superiority beyond dispute.

After submersion in water for ten days their buoyancy was over 30 % greater than that required by law.

We will be pleased to quote prices and terms upon application.

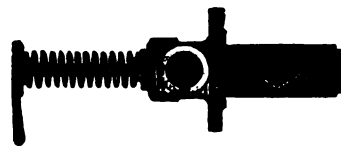
### Armstrong Cork Company

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You can identify the Diamond Flue Blower by this trade mark. It represents advanced ideas and the highest development of the article. Placed on every

### DIAMOND STEAM FLUE BLOWER



This Blower is commended by the leading engineers and most prominent steam users. Its work is quick and thorough—without loss of steam, or slacking of machinery. Just turn the handle—it operates at will. You would profit by having it. Sent on trial without obligation to buy.

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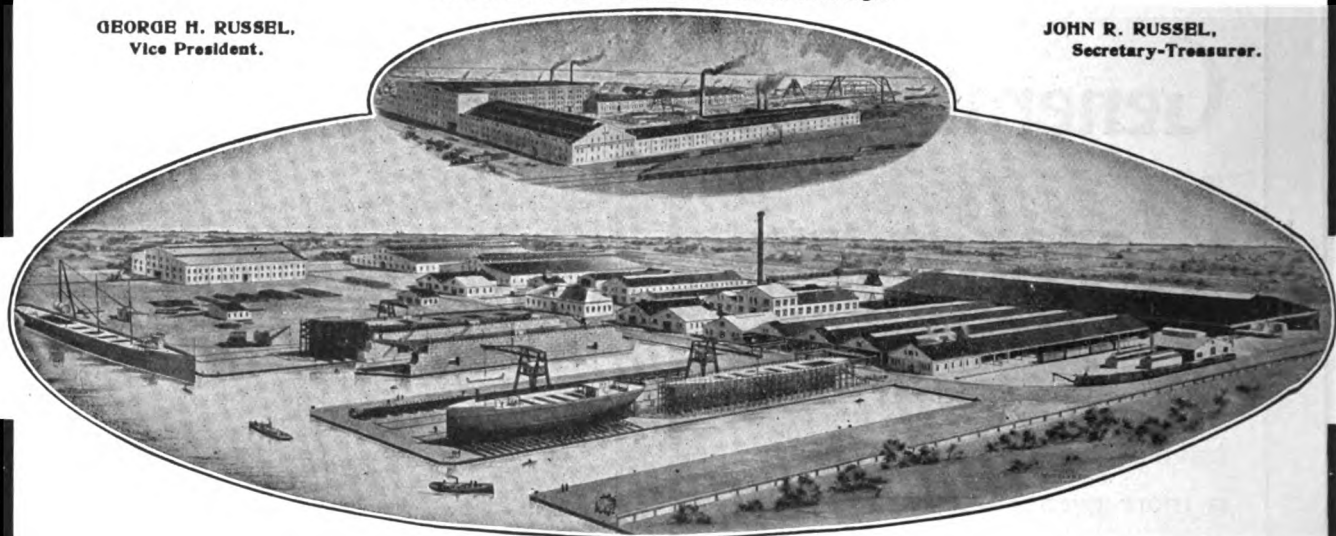
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Russian Imperial Navy	-	-	-	-	-	-	-	-	253,800	"
Japanese Imperial Navy	-	-	-	-	-	-	-	-	122,700	"
Austrian Imperial Navy	-	-	-	-	-	-	-	-	56,700	"
Italian Royal Navy	-	-	-	-	-	-	-	-	32,500	"
Chilian Navy	-	-	-	-	-	-	-	-	26,500	"
Argentine Navy	-	-	-	-	-	-	-	-	13,000	"
The "Messageries Maritimes" Company	-	-	-	-	-	-	-	-	87,600	"
Chemins de fer de l'Ouest: (The French Western Railway Co.)	-	-	-	-	-	-	-	-		Steamships
plying between Dieppe and Newhaven	-	-	-	-	-	-	-	-	18,500	"
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Cam Lever Pop Safety Valves  
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Steam Gauges.

give highest efficiency and durability.  
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$\frac{5}{8}$ " and  $\frac{3}{4}$ " thick, 48" to 72" wide, 120" to 144"  
long, for immediate shipment from our stock.

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PIG IRON  
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Cleveland, Ohio

# Buyers' Directory of the Marine Trade

For a more complete classification than that represented by advertisers in the Marine Review, see the BLUE BOOK OF AMERICAN SHIPPING, marine and naval directory of the United States, published by The Marine Review, Cleveland.

See accompanying index of Advertisers for full addresses of concerns in this directory.

**AIR COMPRESSORS, AIR HOISTS, ETC.**  
Great Lakes Engineering Works.....Detroit.  
Mietz, Aug. ....New York.

**AIR PORTS, DEAD LIGHTS, ETC.**  
Marine Mfg. & Supply Co.....New York.

**AIR PUMPS AND APPLIANCES.**  
Fore River Ship & Engine Co., Quincy, Mass.  
Great Lakes Engineering Works.....Detroit.

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Bowers, L. M. & Co.....Binghamton, N. Y.  
Seaboard Steel Casting Co.....Chester, Pa.

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Holzapfel's American Composition Co.....  
.....New York.

**ANTI-FRICTION METALS.**  
Cramp, Wm. & Sons.....Philadelphia.

**ARTIFICIAL DRAFT FOR BOILERS.**  
American Ship Building Co.....Cleveland.  
Detroit Ship Building Co.....Detroit.  
Great Lakes Engineering Works.....Detroit.  
Sturtevant, B. F., Co.....Hyde Park, Mass.

**ASH EJECTORS.**  
Great Lakes Engineering Works.....Detroit.

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Gilchrist, Albert J.....Cleveland.  
Goulder, Holding & Masten.....Cleveland.  
Hoyt, Dustin & Kelley.....Cleveland.  
Kremer, C. E.....Chicago.  
MacDonald, Ray G.....Chicago.  
Potter & Potter.....Buffalo.  
Shaw, Warren, Cady & Oakes.....Detroit.  
White, Johnson, McCaslin & Cannon Cleveland

**BAROMETERS, MARINE GLASSES, ETC.**

Ritchie, E. S. & Sons.....Brookline, Mass.

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Link Belt Machinery Co.....Chicago.

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Cleveland Block Co.....Cleveland.

**BLOWERS.**  
Power Specialty Co.....Detroit.  
Sturtevant, B. F. Co.....Hyde Park, Mass.

**BOAT BUILDERS.**  
Dretn, Thos. & Son.....Wilmington, Del.  
Kahnweiler's Sons, David.....New York.  
Lane & DeGroot.....Long Island City, N. Y.  
Marine Construction & D. D. Co.....  
.....Mariner's Harbor, S. I., N. Y.  
Truscott Boat Mfg. Co.....St. Joseph, Mich.  
Willard, Chas. P. & Co. Winthrop Harbor, Ill.

**BOILER CLEANING DEVICE.**  
Power Specialty Co.....Detroit.

**BOILER COMPOUNDS.**  
Dearborn Drug & Chemical Works....Chicago.

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American Ship Building Co.....Cleveland.  
Atlantic Works.....East Boston, Mass.  
Babcock & Wilcox Co.....New York.  
Bertram Engine Works Co., Ltd.....  
.....Chicago Ship Building Co.....Chicago.  
Cramp, Wm. & Sons.....Philadelphia.  
Dearing Water Tube Boiler Co.....Detroit.  
Delauney, Belleville & Co., St. Denis, France.  
Detroit Ship Building Co.....Detroit.  
Fletcher, W. A. & Co.....Hoboken, N. J.  
Fore River Shipbuilding Co., Quincy, Mass.  
Georgian Bay Engineering Works.....  
.....Midland, Ont.  
Great Lakes Engineering Works.....Detroit.  
Kingsford Foundry & Machine Works.....  
.....Oswego, N. Y.  
Marine Iron Works.....Chicago.

**BOILER MANUFACTURERS—Continued.**  
Maryland Steel Co.....Sparrows Point, Md.  
Milwaukee Dry Dock Co.....Milwaukee.  
Mosher Water Tube Boiler Co.....New York.  
Newport News Ship Building Co.....  
.....Newport News, Va.  
New York Shipbuilding Co.....Camden, N. J.  
Northwestern Steam Boiler & Mfg. Co.....  
.....Duluth, Minn.  
Roberts Safety Water Tube Boiler Co.....  
.....New York.  
Stirling, The Co.....New York.  
Superior Ship Building Co.....Superior, Wis.  
Taylor Water Tube Boiler Co.....Detroit.  
Willard, Chas. P. & Co., Winthrop Harbor, Ill.

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Bourne-Fuller Co.....Cleveland.

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Great Lakes Engineering Works.....Detroit.  
Lunkenheimer Co.....Cincinnati.  
Macbeth Iron Co.....Cleveland.

**BRIDGES, BUILDERS OF.**  
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Scherzer Rolling Lift Bridge Co.....Chicago.

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.....Cleveland.  
McMyler Mfg. Co.....Cleveland.  
Mayo & Bailey.....Chicago.

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"Long Arm" System Co.....Cleveland.

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Martin-Barriss Co.....Cleveland.

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Baker & Co., H. H.....Buffalo.  
Bunker, E. A.....New York.  
Upson-Walton Co.....Cleveland.

**CAPSTANS.**  
American Ship Windlass Co., Providence, R. I.  
Hyde Windlass Co.....Bath, Me.  
Marine Mfg. & Supply Co.....New York.

**CARPETS, RUGS AND FURNITURE.**  
Williams & Rodgers Co.....Cleveland.

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Smooth-On Mfg. Co.....Jersey City, N. J.

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Woodhouse Chain Works.....Trenton, N. J.

**CHAIN CONVEYORS, HOISTS.**  
Brown Hoisting Machinery Co. (Inc.)....  
.....Cleveland.  
General Electric Co.....Schenectady, N. Y.

**CHAIN HOISTS.**  
Boston & Lockport Block Co.....Boston, Mass.

**CHARTS.**  
Penton Publishing Co.....Cleveland.  
Potter, J. D.....London.

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Ashton Valve Co.....Boston.  
Ritchie, E. S. & Sons.....Brookline, Mass.

**COAL PRODUCERS AND SHIPPERS.**  
Hanna, M. A. & Co.....Cleveland.  
Ironville Dock & Coal Co.....Toledo, O.  
Pickands, Mather & Co.....Cleveland.  
Pittsburg Coal Co.....Cleveland.

**COAL AND ORE HANDLING MACHINERY.**  
Brown Hoisting Machinery Co. (Inc.)....  
.....Cleveland.  
Link Belt Machinery Co.....Chicago.  
McMyler Mfg. Co.....Cleveland.

**COMPASSES.**  
Ritchie, E. S. & Sons.....Brookline, Mass.

**CONDENSERS.**  
Great Lakes Engineering Works.....Detroit.  
Thropp & Sons Co., John E., Trenton, N. J.

**CONTRACTORS FOR PUBLIC WORKS.**  
Breyman & Bros., G. H.....Toledo.  
Buffalo Dredging Co.....Buffalo.  
Chicago & Gt. Lakes Dredge & Dock Co.,  
.....Chicago.  
Dunbar & Sullivan Dredging Co.....Buffalo.  
Fitz-Simons & Connell Co.....Chicago.  
Hickler Bros.....Sault Ste. Marie, Mich.  
Lake Superior Contracting & Dredging Co.,  
.....Duluth, Minn.  
Smith Co., L. P. & J. A.....Cleveland.  
Starke Dredge & Dock Co., C. H., Milwaukee.  
Sullivan, M.....Detroit.

**CORDAGE.**  
Baker & Co., H. H.....Buffalo.  
Upson-Walton Co.....Cleveland.

**CORK JACKETS AND RINGS.**  
Armstrong Cork Co.....Pittsburg, Pa.  
Kahnweiler's Sons, D.....New York.

**CRANES, TRAVELING.**  
Brown Hoisting Machinery Co.....Cleveland.  
McMyler Mfg. Co.....Cleveland.

**DIVING APPARATUS.**  
Morse, A. J. & Son.....Boston.  
Schrader's Son, A.....New York.

**DREDGING CONTRACTORS.**  
Breyman & Bros., G. H.....Toledo.  
Buffalo Dredging Co.....Buffalo.  
Chicago & Gt. Lakes Dredge & Dock Co.,  
.....Chicago.  
Dunbar & Sullivan Dredging Co.....Buffalo.  
Fitz-Simons & Connell Co.....Chicago.  
Hickler Bros.....Sault Ste. Marie, Mich.  
Lake Superior Contracting & Dredging Co.,  
.....Duluth, Minn.  
Smith Co., L. P. & J. A.....Cleveland.  
Starke Dredge & Dock Co., C. H., Milwaukee.  
Sullivan, M.....Detroit.

**DRYING APPARATUS.**  
Sturtevant, B. F. Co.....Hyde Park, Mass.

**DRY DOCKS.**  
American Ship Building Co.....Cleveland.  
Atlantic Works.....East Boston, Mass.  
Buffalo Dry Dock Co.....Buffalo.  
Chicago Ship Building Co.....Chicago.  
Craig Ship Building Co.....Toledo, O.  
Cramp, Wm. & Sons.....Philadelphia.  
Detroit Ship Building Co.....Detroit.  
Great Lakes Engineering Works.....Detroit.  
Lockwood Mfg. Co.....East Boston, Mass.  
Milwaukee Dry Dock Co.....Milwaukee.  
Newport News Ship Building Co.....  
.....Newport News, Va.  
Shipowners Dry Dock Co.....Chicago.  
Superior Ship Building Co.....Superior, Wis.

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General Electric Co.....Schenectady, N. Y.

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General Electric Co.....Schenectady, N. Y.  
Mietz, Aug. ....New York.  
Sturtevant, B. F. & Co.....Hyde Park, Mass.  
Thropp & Sons, John E.....Trenton, N. J.



**WANTED and FOR SALE Department.****PROPOSALS.**

**PROPOSALS FOR REPAIRING BREAK-WATER.**—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 8, 1905. Sealed proposals for repairing the shore end of the West Breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P.M., May 6, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. April 27

**PROPOSALS FOR SHEATHING BREAK-WATER.**—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 8, 1905. Sealed proposals for sheathing the harbor face of the West Breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P.M., May 6, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. April 27

**PROPOSALS FOR RIPRAPSTONE FILLING.**—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 8, 1905. Sealed proposals for filling with large riprap along the lake face of the West Breakwater at Cleveland Harbor, Ohio, will be received at this office until 2 P.M. May 6, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. April 27

**PROPOSALS FOR CONSTRUCTION OF BREAKWATER.**—U. S. Engineer Office, 262 Huron Street, Cleveland O., April 4, 1905. Sealed proposals for constructing the shore end of the West Breakwater at Fairport Harbor, Ohio, will be received at this office until 2 P.M. May 6, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. April 27.

U. S. Engineer Office, Milwaukee, Wis., April 15, 1905.—Sealed proposals for dredging Gladstone Harbor, Mich., concrete superstructure on Breakwater and on North Harbor Pier, Milwaukee, Wis., and removing old piers and building pile piers and timber superstructure, Waukegan Harbor, Ill., will be received here until 3 P. M., standard time, May 10, 1905, and then publicly opened. Information furnished on application. J. G. Warren, Major Engrs. may 11

**PROPOSALS FOR RECONSTRUCTING PIER.**—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 17th, 1905. Sealed proposals for reconstructing and repairing parts of the West Pier at Lorain Harbor, Ohio, will be received at this office until 2 P. M. May 19th, 1905, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. may 11

**PROPOSALS FOR DREDGING.**—U. S. Engineer Office, 262 Huron Street, Cleveland, O., April 19, 1905. Sealed proposals for improving Cleveland Harbor, Ohio, by dredging, will be received at this office until 2 P. M., May 22d, 1905, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. DAN C. KINGMAN, Lieut. Col. Corps of Engineers, U. S. A. May 18

U. S. Engineer Office, Buffalo, N. Y. April 26, 1905. Sealed proposals for dredging in Buffalo River Entrance Channel will be received here until 11 A. M., May 26, 1905, and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Engrs. May 18

U. S. Engineer Office, Buffalo, N. Y., April 22, 1905. Sealed proposals for extending south pier and placing concrete superstructure on north pier at Erie, Pa., will be received here until 11 A. M., May 22, 1905, and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Engrs. May 18

**PROPOSALS.**

U. S. Engineer Office, Buffalo, N. Y., April 15, 1905.—Sealed proposals for channel and basin excavation at Erie Harbor, Pa., will be received here until 11 A. M. May 15, 1905, and then opened. Information furnished on application.—H. M. Adams, Lieut. Col. Engr's. may 11

U. S. Engineer Office, Duluth, Minn., April 13, 1905.—Sealed proposals for furnishing and placing about 53,000 tons of riprap at Ashland, Wis., will be received here until noon, May 13, 1905, and then publicly opened. Information on application. Chas. L. Potter, Major Engrs. may 11

U. S. Engineer Office, Room 508 Federal Bldg., Chicago, Ill., April 15, 1905.—Sealed proposals for rock excavation in Calumet River, Ill., will be received here until noon May 15, 1905, and then publicly opened. Information on application. Wm. H. Bixby, Lieut. Col. Engrs. may 11

U. S. Engineer Office, Buffalo, N. Y., April 13, 1905.—Sealed proposals for concrete superstructure on south pier, Buffalo, N. Y., will be received here until 11 A. M. May 13, 1905, and then opened. Information furnished on application.—H. M. Adams, Lieut. Col. Engr's. may 11

U. S. ENGINEER OFFICE, Buffalo, N. Y., April 20, 1905.—Sealed proposals for breakwater extension at Cape Vincent, N. Y. will be received here until 11 A.M. May 20, 1905 and then opened. Information furnished on application. H. M. Adams, Lieut. Col. Engr's. may 18

**FOR SALE.****Patent on Valuable Nautical Invention.**

A device in the form of an air buoy for definitely locating sunken vessels. Should the vessel sink upon which this buoy is placed, the buoy floats, and a line, made fast in a separate compartment, unreels until the vessel strikes bottom, thereby locating the exact position of the sunken vessel. This buoy is also adapted for use as a mooring buoy for yachts of all sizes, and for all floating property. It can be manufactured and sold for much less than any other buoy in use. Will sell the patent for cash or exchange for vessel or other property. Address, Capt. J. Fred Tribble, 59 Broadway, Norwich, Conn. t.f.

**Tug Wm. Engel.**

A first class fishing rig for sale. Tug suitable for fishing or towing. For further information write to Thomas Mader, 81 Middle St., Kenosha, Wis. t.f

**Steam Yacht for Sale.**

A 71 foot steam yacht, thoroughly up to date, of handsome lines; a splendid sea boat; perfectly equipped and in order, and well adapted for Southern or South American waters; an excellent boat for cruising; now getting ready to go into commission; photographs and particulars submitted. A Mugford, 136 Liberty St., New York. April 27

**For Sale.**

FOR SALE.—Electric dynamos, direct connected to engines, also search-lights for marine work; good condition; cheap. JORDAN BROS., 74 Beekman St., New York. April 27

**FOR SALE.****Motor Boat For Sale.**

On the St. Lawrence river: A specially built motor boat, 32x6, fitted with a double cylinder, 14 horse motor. A remarkably beautiful and excellent boat, but as the owner thinks it too small for his use, will sacrifice so as to build a larger one. Big bargain for some one. It is almost finished. Do not overlook this. I have dozens of other hulls in stock, all sizes, all prices, or will build to order anything you want. Henry E. Francis, Jr., Alexandria Bay, N. Y. t.f

**FOR SALE.****Steam Yacht Cygnet**

35 ft. over all; 7 ft. beam. Has electric light and keel condenser. Burns oil for fuel. In fine order.

J. L. ALBERGER,

Ellicott Square. - BUFFALO, N. Y. May 4

**Tug Jim Pullar and Scow.**

Tug—built in 1894; 61 ft. long; 15 ft. beam. Water tube boiler. Compound condensing engine. Strong and seaworthy.

Scow—five years old. Excellent construction; 132 ft. long; 29½ ft. wide at center, 26 ft. wide at ends. Platform style, with stake pockets.

Tug and Scow recently overhauled and are in good condition. May be seen at Washburn, Wis., dock.

Address, Fowler-Jacobs Co., Fisher Building, Chicago. t.f.

**WANTED.****Steamer Wanted.**

Wanted to purchase a screw steamer not over 110 ft. nor less than 100 ft. long, to carry from 300 to 500 passengers. Prefer draft not over 5 ft. Must be speedy and well equipped for passenger service. Send full particulars and photo to P. O. Box 152, Norwich, Conn. April 27.

**Tug Wanted.**

Wanted, a good second-hand tug boat, 35 to 50 ft. in length, not over 13 ft. beam amidships, about 5 ft. draft. Hull particularly to be in first class condition. Address the Wolverine Portland Cement Co., Coldwater, Mich. May 11.

**Tug Wanted.**

Tug 50 ft. long, 13 ft. beam, 6 ft. depth, with 12 x 14 engine. State age of boiler and hull. Address Marine, 99 Northampton street, Buffalo, N. Y. April 27.

**Salesmen Wanted.**

Wanted.—Salesmen or agents to sell a patented specialty of great merit for boilers, which is already being used by the largest concerns. Address Power Specialty Co., 513 Washington Arcade, Detroit, Mich. t.f.

## Buyers' Directory of the Marine Trade.—Continued.

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 ..... Toronto, Can.  
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 Craig Ship Building Co. .... Toledo, O.  
 Dake Engine Co. .... Grand Haven, Mich.  
 Detroit Ship Building Co. .... Detroit.  
 Fletcher, W. & A. Co. .... Hoboken, N. J.  
 Fore River Shipbuilding Co. .... Quincy, Mass.  
 Great Lakes Engineering Works. .... Detroit, Mich.  
 Hall Bros. .... Philadelphia.  
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 Marine Iron Works. .... Chicago.  
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 Mietz, Aug. .... New York.  
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 Mosher, Chas. D. .... New York.  
 Moulton Steering Engine Co. .... New York.  
 Newport News Ship Building Co. ....  
 ..... Newport News, Va.  
 New York Shipbuilding Co. .... Camden, N. J.  
 Northwestern Steam Boiler & Mfg. Co. ....  
 ..... Duluth, Mich.  
 Roach's Ship Yard. .... Chester, Pa.  
 Sheriffs Mfg. Co. .... Milwaukee.  
 Superior Ship Building Co. .... Superior, Wis.  
 Thropp, J. E. & Sons Co. .... Trenton, N. J.  
 Trout, H. G. .... Buffalo.  
 Willard, Chas. P. & Co. .... Winthrop Harbor, Ill.

**ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.**

Cory, Chas. & Son. .... New York.  
 Marine Mfg. Supply Co. .... New York.

**ENGINE TESTING.**

Kreer & Parsons. .... Chicago.

**ENGINEERING SPECIALTIES AND SUPPLIES.**

Crane Co. .... Chicago.  
 Kieley & Mueller. .... New York.  
 Lunkenheimer Co. .... Cincinnati.  
 New York Belting & Packing Co. .... New York.  
 Northwestern Steam Boiler & Mfg. Co. ....  
 ..... Duluth, Minn.

**ENGINEERS, MARINE, MECHANICAL, CONSULTING.**

Hynd, Alexander. .... Cleveland.  
 Hunt, Robt. W. & Co. .... Chicago.  
 Kidd, Joseph. .... Duluth, Minn.  
 Kreer & Parsons. .... Chicago.  
 Lovejoy, H. O. .... Buffalo.  
 Mosher, Chas. D. .... New York.  
 Nacey, James. .... Cleveland.  
 Rice, Henry. .... Buffalo.  
 Roelker, H. B. .... New York.  
 Wood, W. J. .... Chicago.

**FANS FOR VENTILATION, EXHAUST, ETC.**

Sturtevant, B. F. Co. .... Hyde Park, Mass.

**FEED WATER PURIFIERS AND HEATERS.**

Greacen-Derby Engineering Co. ....  
 ..... Perth Amboy, N. J.  
 Reilly Repair and Supply Co., Jas. .... New York.  
 Ross Valve Co. .... Troy, N. Y.

**FIXTURES FOR LAMPS, OIL OR ELECTRIC.**

General Electric Co. .... Schenectady, N. Y.

**FORGES.**

Sturtevant, B. F. Co. .... Boston.

**FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.**

Cleveland City Forge & Iron Co. .... Cleveland.  
 Fore River Shipbuilding Co. .... Quincy, Mass.  
 Macbeth Iron Co. .... Cleveland.

**FLUE WELDING.**

Fix's, S. Sons. .... Cleveland.

**FUEL ECONOMIZERS.**

Sturtevant Co., B. F. .... Hyde Park, Mass.

**FUELING COMPANIES AND COAL DEALERS.**

Hanna, M. A. & Co. .... Cleveland.  
 Ironville Dock & Coal Co. .... Toledo, O.  
 Parker Bros. Co., Ltd. .... Detroit.  
 Pickands, Mather & Co. .... Cleveland.  
 Pittsburg Coal Co. .... Cleveland.  
 Smith, Stanley B., & Co. .... Detroit.  
 Smith Coal & Dock Co., Stanley B. .... Toledo, O.

**FUELING PLANTS, BUILDERS OF**

Link Belt Machinery Co. .... Chicago.

**FURNACES FOR BOILERS.**

Continental Iron Works. .... New York.

**GAS BUOYS.**

Safety Car Heating & Lighting Co. .... New York.

**GAS AND GASOLINE ENGINES.**

Chase Machine Co. .... Cleveland.  
 Georgian Bay Engineering Works. ....  
 ..... Midland, Ont.

**GAUGES, STEAM AND VACUUM.**

American Steam Gauge & Valve Mfg. Co. ....  
 ..... Boston.  
 Ashton Valve Co. .... Boston.  
 Lunkenheimer Co. .... Cincinnati.

**GAUGES, WATER.**

Bonner & Co., Wm. T. .... Boston.  
 Lunkenheimer Co. .... Cincinnati, O.

**GRAPHITE.**

Dixon Crucible Co., Joseph. .... Jersey City, N. J.

**GREASE EXTRACTORS.**

Greacen-Derby Engineering Co. ....  
 ..... Perth Amboy, N. J.

**HAMMERS, STEAM.**

Chase Machine Co. .... Cleveland.

**HEATING APPARATUS.**

Sturtevant, B. F. Co. .... Hyde Park, Mass.

**HOISTS FOR CARGO, ETC.**

American Ship Building Co. .... Cleveland.  
 Brown Hoisting Machinery Co. (Inc.) ....  
 ..... Cleveland.  
 Chase Machine Co. .... Cleveland.  
 General Electric Co. .... New York.  
 Georgian Bay Engineering Works. ....  
 ..... Midland, Ont.  
 Hyde Windlass Co. .... Bath, Me.  
 McMyler Mfg. Co. .... Cleveland.  
 Marine Iron Co. .... Bay City.  
 Mietz, Aug. .... New York.

**HOLLOW STAYBOLT IRON.**

Falls Hollow Staybolt Co. .... Cuyahoga Falls, O.

**HOSE, RUBBER.**

New York Belting & Packing Co. .... New York.

**HYDRAULIC DREDGES.**

Great Lakes Engineering Works. .... Detroit.

**HYDRAULIC TOOLS.**

Watson-Stillman Co., The. .... New York.

**ICE MACHINERY.**

Great Lakes Engineering Works. .... Detroit.  
 Roelker, H. B. .... New York.

**INDICATORS FOR STEAM ENGINES.**

American Steam Gauge Co. .... Boston.  
 Ashton Valve Co. .... Boston.

**INJECTORS.**

American Injector Co. .... Detroit.  
 Crane Co. .... Chicago.  
 Jenkins Bros. .... New York.  
 Lunkenheimer Co. .... Cincinnati.  
 Penberthy Injector Co. .... Detroit, Mich.

**INSURANCE, MARINE.**

Elphicke, C. W. & Co. .... Chicago.  
 Fleming & Co., E. J. .... Chicago.  
 Gilchrist & Co., C. P. .... Cleveland.  
 Hawgood & Co., W. A. .... Cleveland.  
 Helm & Co., D. T. .... Duluth.  
 Hutchinson & Co. .... Cleveland.  
 McCarthy, T. R. .... Montreal.  
 McCurdy, Geo. L. .... Chicago.  
 Mitchell & Co. .... Cleveland.  
 Parker Bros. Co., Ltd. .... Detroit.  
 Peck, Chas. E. & W. F. .... New York & Chicago.  
 Prindiville & Co. .... Chicago.  
 Richardson, W. C. .... Cleveland.  
 Sullivan, D. & Co. .... Chicago.

**IRON ORE AND PIG IRON.**

Bourne-Fuller Co. .... Cleveland, O.  
 Hanna, M. A. & Co. .... Cleveland.  
 Pickands, Mather & Co. .... Cleveland.

**LAUNCHES—STEAM, NAPHTHA, ELECTRIC.**

Georgian Bay Engineering Works. ....  
 ..... Midland, Ont.  
 Marine Iron Works. .... Chicago.  
 Truscott Boat Mfg. Co. .... St. Joseph, Mich.  
 Willard, Chas. P. .... Winthrop Harbor, Ill.

**LIFE PRESERVERS, LIFE BOATS, BUOYS.**

Armstrong, Cork Co. .... Pittsburg.  
 Drein, Thos. & Son. .... Wilmington, Del.  
 Gaynor, T. F. .... New York.  
 Kahnweiler's Sons, D. .... New York.  
 National Cork Co. .... Brooklyn.

**LIGHTS, SIDE AND SIGNAL.**

Russell & Watson. .... Buffalo.

**LOGS.**

Nicholson Ship Log Co. .... Cleveland.  
 Walker & Sons, Thomas. .... Birmingham, Eng.  
 Also Ship Chandlers.

**LUBRICATING GRAPHITE.**

Dixon Crucible Co., Joseph. .... Jersey City, N. J.

**LUBRICATORS.**

Crane Co. .... Chicago.  
 Lunkenheimer Co. .... Cincinnati.

**LUMBER.**

Martin-Barriss Co. .... Cleveland.

**MACHINISTS.**

Chase Machine Co. .... Cleveland.  
 Hickler Bros. .... Sault Ste. Marie, Mich.  
 Lockwood Mfg. Co. .... East Boston, Mass.

**MACHINE TOOLS (WOOD WORKING).**

Atlantic Works, Inc. .... Philadelphia.

**MARINE RAILWAYS.**

Hickler Bros. .... Sault Ste. Marie, Mich.

**MARINE RAILWAYS, BUILDERS OF.**

Crandall & Son, H. L. .... East Boston, Mass.

**MATTRESSES, CUSHIONS, BEDDING.**

Fogg, M. W. .... New York.

**MECHANICAL DRAFT FOR BOILERS.**

American Ship Building Co. .... Cleveland.  
 Detroit Ship Building Co. .... Detroit.  
 Great Lakes Engineering Works. .... Detroit.  
 Sturtevant, B. F. Co. .... Hyde Park, Mass.

**METALLIC PACKING.**

Katzenstein, L. & Co. .... New York.

**METAL POLISH.**

Bertram's Oil Polish Co. .... Boston.

**MOTORS, GENERATORS—ELECTRIC.**

Fisher Electrical Works. .... Detroit.  
 General Electric Co. .... Schenectady, N. Y.  
 Sturtevant, B. F. Co. .... Hyde Park, Mass.

**NAUTICAL INSTRUMENTS.**

Ritchie, E. S., & Sons. .... Brookline, Mass.

**NAVAL ARCHITECTS.**

Hynd, Alexander. .... Cleveland.  
 Kidd, Joseph. .... Duluth, Minn.  
 Kreer & Parsons. .... Chicago.  
 Lovejoy, H. O. .... Buffalo.  
 Matteson & Drake. .... Philadelphia.  
 Mosher, Chas. D. .... New York.  
 Nacey, James. .... Cleveland.  
 Rice, Henry. .... Buffalo.  
 Wood, W. J. .... Chicago.

**OAKUM.**

Stratford, Oakum Co. .... Jersey City, N. J.

**OIL ENGINES.**

Mietz, Aug. .... New York.

**OILS AND LUBRICANTS.**

Dixon Crucible Co., Joseph. .... Jersey City, N. J.  
 Standard Oil Co. .... Cleveland.

**PACKING.**

Crane Co. .... Chicago.  
 Jenkins Bros. .... New York.  
 Katzenstein, L. & Co. .... New York.  
 New York Belting & Packing Co. .... New York.

**PAINTS.**

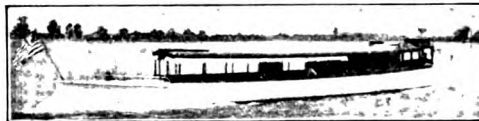
Baker, Howard H. & Co. .... Buffalo.  
 Carbolineum Wood Preserving Co. .... Milwaukee.  
 New Jersey Zinc Co. .... New York.  
 Upson-Walton Co. .... Cleveland.

**PATTERN SHOP MACHINERY.**

Atlantic Works, Inc. .... Philadelphia.

**WANTED and FOR SALE Department Continued.****Steam Yacht Catherine.**

FOR SALE—Length 78 ft., beam 18 ft., triple expansion engines, water-tube boiler, allowed 200 lbs.; electric light, search light, mahogany deck-house 9 x 16, power launch, complete outfit, all in first-class condition. One of the best family cruising yachts on the Lakes. Inquire Wickes Bros., Saginaw, Mich. tf

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This up-to-date Gasoline Yacht 65x9½, mahogany finished throughout; large cabin, plate glass windows, mahogany blinds; fine carpets and upholstery; excellent electric light plant—dynamo, storage batteries and search light. Entire boat can be easily converted into cabin if desired.

Rapid fire yacht cannon; anchor, life preservers, flags, etc., complete. Very fast 4 cylinder, 4 cycle King engine of 50 h. p. Cost nearly \$8,000, will sell at great bargain.

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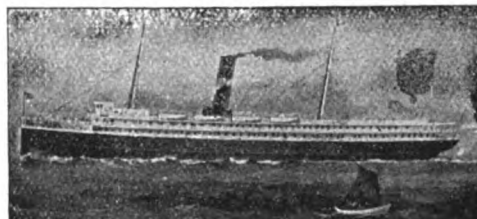
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AND ALL OTHER FURNISHINGS USED IN CABINS.

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**PILE DRIVING AND SUBMARINE WORK.**

Buffalo Dredging Co. .... Buffalo.  
Chicago & Gt. Lakes Dredge & Dock Co. .... Chicago.  
Dunbar & Sullivan Dredging Co. .... Buffalo.  
Fitz-Simons & Connell Co. .... Chicago.  
Hickler Bros. .... Sault Ste. Marie, Mich.  
Lake Superior Contracting & Dredging Co. .... Duluth, Minn.  
Parker Bros. Co., Ltd. .... Detroit.  
Smith Co., L. P. & J. A. .... Cleveland.  
Starke Dredge & Dock Co., C. H. .... Milwaukee.  
Sullivan, M. .... Detroit.

**PIPE, WROUGHT IRON.**

Bourne-Fuller Co. .... Cleveland, O.  
Crane Co. .... Chicago.  
Macbeth Iron Co. .... Cleveland.  
Reading Iron Co. .... Reading, Pa.

**PLANING MILL MACHINERY.**

Atlantic Works, Inc. .... Philadelphia.

**PLATES—SHIP, STRUCTURAL, ETC.**

Bourne-Fuller Co. .... Cleveland, O.  
Otis Steel Co. .... Cleveland.  
Reading Iron Co. .... Reading, Pa.

**PRESSURE REGULATORS.**

Kieley & Mueller .... New York.  
Ross Valve Co. .... Troy, N. Y.

**PROPELLER WHEELS.**

American Ship Building Co. .... Cleveland.  
Atlantic Works, Inc. .... East Boston, Mass.  
Cramp, Wm. & Sons. .... Philadelphia.  
Detroit Ship Building Co. .... Detroit.  
Fore River Shipbuilding Co. .... Quincy, Mass.  
Great Lakes Engineering Works. .... Detroit.  
Hyde Windlass Co. .... Bath, Me.  
Lockwood Mfg. Co. .... East Boston, Mass.  
Marine Iron Works. .... Chicago.  
Milwaukee Dry Dock Co. .... Milwaukee.  
Newport News Ship Building Co. .... Newport News, Va.  
Roelker, H. B. .... New York.  
Sheriffs Mfg. Co. .... Milwaukee.  
Superior Ship Building Co. .... Superior, Wis.  
Thropp & Sons Co., J. E. .... Trenton, N. J.  
Trout, H. G. .... Buffalo.

**PROJECTORS, ELECTRIC.**

General Electric Co. .... Schenectady, N. Y.

**PUMPS FOR VARIOUS PURPOSES.**

Blake, Geo. F., Mfg. Co. .... New York.  
Great Lakes Engineering Works. .... Detroit.  
Marine Iron Works. .... Chicago.  
Kingsford Foundry & Machine Works. .... Oswego, N. Y.

**RANGES.**

Stamford Foundry Co. .... Stamford, Conn.

**REFRIGERATING APPARATUS.**

Great Lakes Engineering Works. .... Detroit.  
Roelker, H. B. .... New York.

**REGISTER FOR CLASSIFICATION OF VESSELS.**

Great Lakes Register. .... Cleveland.

**REPAIRS—ENGINE AND BOILER.**

(See also Boiler Manufacturers and Engine Builders.)  
Georgian Bay Engineering Works. .... Midland, Ont.

**RIVETS, STEEL FOR SHIPS AND BOILERS.**

Bourne-Fuller Co. .... Cleveland, O.

**SAFETY VALVES.**

American Steam Gauge & Valve Mfg. Co. .... Boston.  
Ashton Valve Co. .... Boston.  
Crane Co. .... Chicago.  
Lunkheimer Co. .... Cincinnati.

**SAIL MAKERS.**

Baker, Howard H. & Co. .... Buffalo.  
Upson-Walton Co. .... Cleveland.

**SALVAGE COMPANIES.**

See Wrecking Companies.

**SEARCH LIGHTS.**

General Electric Co. .... Schenectady, N. Y.

**SHEARS.**

See Punches, Rivets, and Shears.

**SHIP AND BOILER PLATES AND SHAPES.**

Bourne-Fuller Co. .... Cleveland, O.  
Otis Steel Co. .... Cleveland.

**SHIP BUILDERS.**

American Ship Building Co. .... Cleveland.  
Atlantic Works, Inc. .... East Boston, Mass.  
Bertram Engine Works Co., Ltd. .... Toronto, Can.  
Buffalo Dry Dock Co. .... Buffalo.  
Cramp, Wm. & Sons. .... Philadelphia.  
Craig Ship Building Co. .... Toledo, O.  
Chicago Ship Building Co. .... Chicago.  
Detroit Ship Building Co. .... Detroit.  
Fore River Shipbuilding Co. .... Quincy, Mass.  
Great Lakes Engineering Works. .... Detroit.  
Lockwood Mfg. Co. .... East Boston, Mass.  
Maryland Steel Co. .... Sparrows Point, Md.  
Milwaukee Dry Dock Co. .... Milwaukee.  
Newport News Ship Building Co. .... Newport News, Va.

New York Shipbuilding Co. .... Camden, N. J.  
Roach's Ship Yard. .... Chester, Pa.  
Shipowner's Dry Dock Co. .... Chicago.  
Smith & Son, Abram. .... Algonac, Mich.  
Willard, Chas. P. & Co. .... Winthrop Harbor, Ill.

**SHIP CHANDLERS.**

Baker, Howard H. & Co. .... Buffalo.  
Marine Mfg. & Supply Co. .... New York.  
Upson-Walton Co. .... Cleveland.

**SHIP DESIGNERS.**

Kidd, Joseph. .... Duluth.  
Kreer & Parsons. .... Chicago.  
Matteson & Drake. .... Buffalo.  
Rice & Lovejoy. .... Buffalo.  
Steel, Nacey & Hynd. .... Cleveland.  
Wood, W. J. .... Chicago.

**SHIP LANTERNS AND LAMPS.**

Russell & Watson. .... Buffalo.

**SHIPMATE RANGES.**

Stamford Foundry Co. .... Stamford, Conn.

**SHIP TIMBER.**

Martin-Barriss Co. .... Cleveland.

**SMOOTH-ON COMPOUND, FOR REPAIRS.**

Smooth-On Mfg. Co. .... Jersey City, N. J.

**STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.**

Falls Hollow Staybolt Co. .... Cuyahoga Falls, O.  
Reading Iron Co. .... Reading, Pa.

**STEAM VESSELS FOR SALE.**

Gilchrist & Co., C. P. .... Cleveland.  
Holmes, Samuel. .... New York.  
Lester, S. S. .... Quebec, Can.  
McCarthy, T. R. .... Montreal, Can.

**STEAMSHIP LINES, PASS, AND FREIGHT.**

American Line. .... New York.  
Anchor Line. .... Buffalo.  
Boston Steamship Co. .... Boston.  
International Mercantile Marine Co. .... Philadelphia.  
New York & Cuba Mail S. S. Co. .... New York.  
Red Star Line. .... New York.  
United Fruit Co. .... Boston.

**STEEL CASTINGS.**

Otis Steel Co. .... Cleveland.

**STEERING APPARATUS.**

American Ship Building Co. .... Cleveland.  
Chase Machine Co. .... Cleveland.  
Detroit Ship Building Co. .... Detroit.  
Hyde Windlass Co. .... Bath, Me.  
Marine Mfg. & Supply Co. .... New York.  
Moulton Steering Engine Co. .... New York.  
Sheriffs Mfg. Co. .... Milwaukee.

**SUBMARINE DIVING APPARATUS.**

Morse & Son, A. J. .... Boston.  
Schrader's Son, A. .... New York.

**SURVEYORS, MARINE.**

Gaskin, Edward. .... Buffalo.  
Hynd, Alexander. .... Cleveland.  
Lovejoy, H. O. .... Buffalo.  
Matteson & Drake. .... Philadelphia.  
Parker Bros. Co., Ltd. .... Detroit.  
Nacey, James. .... Cleveland.  
Rice, Henry. .... Buffalo.  
Steel, Adam. .... Cleveland.  
Wood, W. J. .... Chicago.

**TESTS OF MATERIALS.**

Hunt, Robert W. & Co. .... Chicago.  
Lunkheimer Co. .... Cincinnati, O.

**TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.**

Watson-Stillman Co. .... New York.

**TOOLS, WOOD WORKING.**

Atlantic Works, Inc. .... Philadelphia.

**TOWING MACHINES.**

American Ship Windlass Co. .... Providence, R. I.  
Chase Machine Co. .... Cleveland.

**TOWING COMPANIES.**

Donnelly Salvage & Wrecking Co. .... Kingston, Ont.

**TRAPS, STEAM.**

Kieley & Mueller. .... New York.  
Sturtevant Co., B. F. .... Hyde Park, Mass.

**TRUCKS.**

Boston & Lockport Block Co. .... Boston.

**TUBING, SEAMLESS.**

Shelby Steel Tube Co. .... Pittsburg, Pa.

**VALVES, STEAM SPECIALTIES, ETC.**

American Steam Gauge & Valve Mfg. Co. .... Boston.  
Ashton Valve Co. .... Boston.  
Crane Co. .... Chicago.  
Jenkins Bros. .... New York.  
Kieley & Mueller. .... New York.  
Lunkheimer Co. .... Cincinnati.  
Ross Valve Co. .... Troy, N. Y.

**VALVES FOR WATER AND GAS.**

Lunkheimer Co. .... Cincinnati.  
Ross Valve Co. .... Troy, N. Y.

**VARNISHES.**

Detroit Varnish Co. .... Detroit.  
Detroit White Lead Works. .... Detroit.  
New Jersey Zinc Co. .... New York.  
Also Ship Chandlers.

**VENTILATING APPARATUS FOR SHIPS.**

Sturtevant, B. F. Co. .... Hyde Park, Mass.

**VESSEL AND FREIGHT AGENTS.**

Boland, John J. .... Buffalo.  
Brown & Co. .... Buffalo.  
Elphicke, C. W. & Co. .... Chicago.  
Fleming & Co., E. J. .... Chicago.  
Gilchrist & Co., C. P. .... Cleveland.  
Hall, John B. .... Buffalo.  
Helm & Co., D. T. .... Duluth.  
Hawgood & Co., W. A. .... Cleveland.  
Holmes, Samuel. .... New York.  
Hutchinson & Co. .... Cleveland.  
Lester, S. S. .... Quebec, Can.  
McCarthy, T. R. .... Montreal.  
Mitchell & Co. .... Cleveland.  
Parker Bros. Co., Ltd. .... Detroit.  
Prindiville & Co. .... Chicago.  
Richardson, W. C. .... Cleveland.  
Sullivan, D. & Co. .... Chicago.

**VESSEL FURNISHINGS.**

Williams & Rodgers Co. .... Cleveland.

**WATER GAUGES.**

Bonner & Co., Wm. T. .... Boston.  
Lunkheimer Co. .... Cincinnati, O.

**WATERTIGHT BULKHEAD DOORS.**

"Long Arm" System Co. .... Cleveland.

**WHISTLES, STEAM.**

American Steam Gauge & Valve Mfg. Co. .... Boston.

Ashton Valve Co. .... Boston.

Lunkheimer Co. .... Cincinnati.

**WILFORD'S WATERPROOF CLOTH.**

Bunker, E. A. .... New York.

**WIRE ROPE AND WIRE ROPE FITTINGS.**

Baker, H. H. & Co. .... Buffalo.  
DeGrauw, Aymar & Co. .... New York.  
Upson-Walton Co. .... Cleveland.

**WINDLASSES.**

American Ship Windlass Co. .... Providence, R. I.  
American Ship Building Co. .... Cleveland.  
Hyde Windlass Co. .... Bath, Me.  
Marine Mfg. & Supply Co. .... New York.

**WINCHES.**

American Ship Windlass Co. .... Providence, R. I.

Georgian Bay Engineering Works. .... Midland, Ont.

Hyde Windlass Co. .... Bath, Me.

**WOOD PRESERVING PAINT.**

Carbolineum Wood Preserving Co. .... Milwaukee.

**WOOD WORKING MACHINERY.**

Atlantic Works, Inc. .... Philadelphia.

**WRECKING AND SALVAGE COMPANIES.**

Donnelly Salvage & Wrecking Co. .... Kingston, Ont.

Parker Bros. Co., Ltd. .... Detroit.

**YACHT AND BOAT BUILDERS.**

Bertram Engine Works Co., Ltd. .... Toronto, Can.

Drein, Thos. & Son. .... Wilmington, Del.

Georgian Bay Engineering Works. .... Midland, Ont.

Truscott Boat Mfg. Co. .... St. Joseph, Mich.

Willard, Chas. P. & Co. .... Winthrop Harbor, Ill.

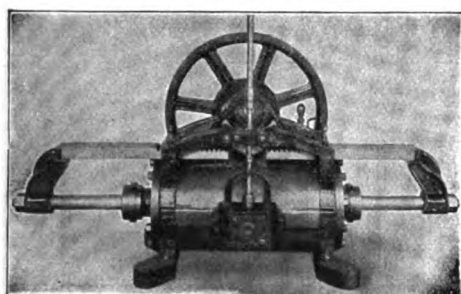
**YACHT BROKERS.**

Clapham & Clapham. .... New York.

**YAWLS.**

Drein, Thos. & Son. .... Wilmington, Del.



**A STEAM STEERER**

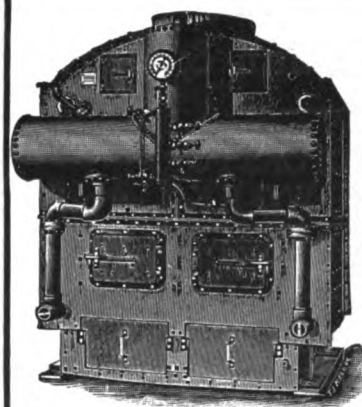
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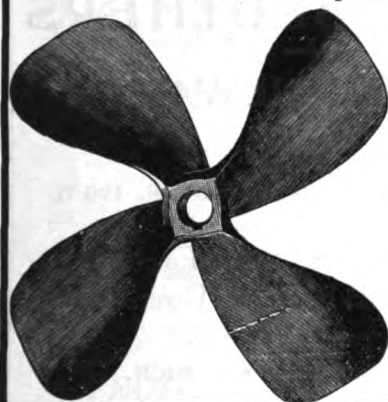
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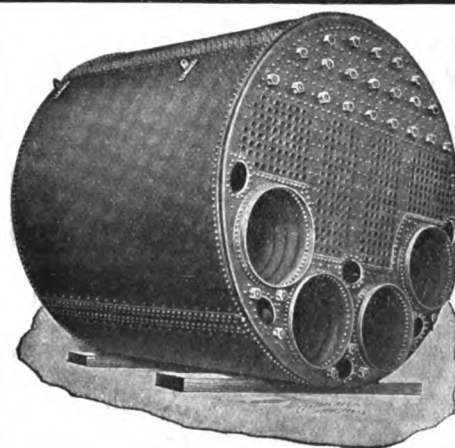


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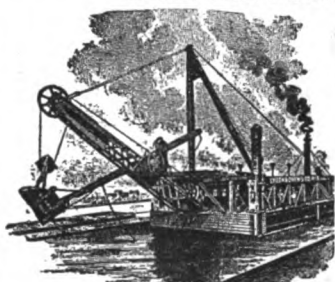
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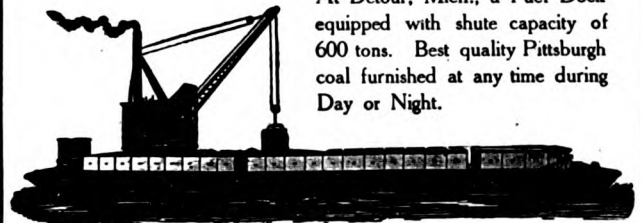
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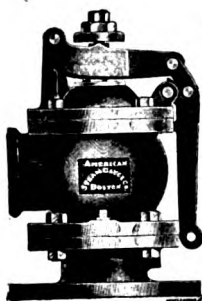
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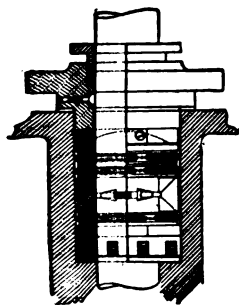


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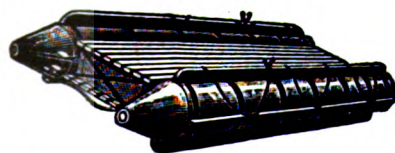
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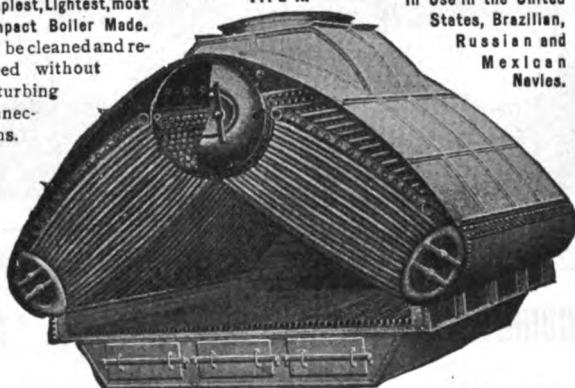
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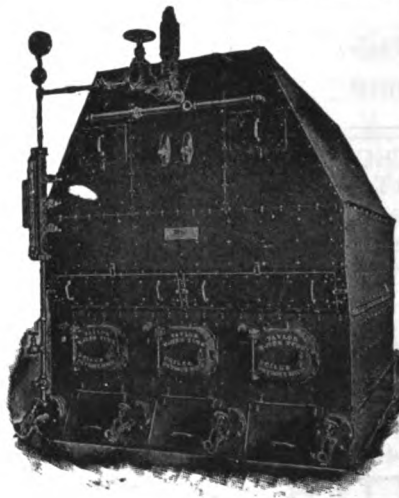
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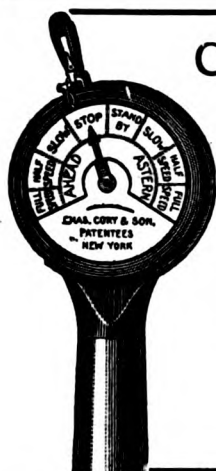
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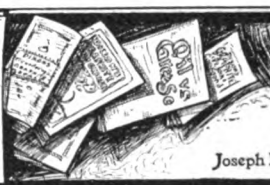
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No. 20, Chicago and Cleveland Exp. ....	*7:20 a.m.	.....
No. 28, New York and Boston Exp. ....	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom. ....	†10:00 a.m.	†10:30 a.m.
No. 32, Fast Mail .....	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky .....	†1:40 p.m.	.....
No. 42, Boston-New York Express .....	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl. ....	.....	*3:00 p.m.
No. 46, Southwestern Express .....	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation .....	.....	†4:30 p.m.
No. 6, Limited Fast Mail .....	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited .....	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl. ....	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express .....	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express .....	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation .....	†7:55 a.m.	.....
Westward	Arrive from East	Depart West
No. 7, Exposition Limited .....	*12:50 a.m.	.....
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No. 9, Day Express .....	.....	†6:00 a.m.
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No. 23, Western Express .....	*10:30 a.m.	*10:35 a.m.
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No. 33, Southwestern Express .....	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp. ....	.....	*12:45 p.m.
No. 47, Accommodation .....	†11:00 a.m.	†3:00 p.m.
No. 141, Sandusky Accommodation .....	.....	†3:10 p.m.
No. 43, Fast Mail .....	*4:35 p.m.	*4:40 p.m.
No. 127, Norwalk Accommodation .....	.....	†5:10 p.m.
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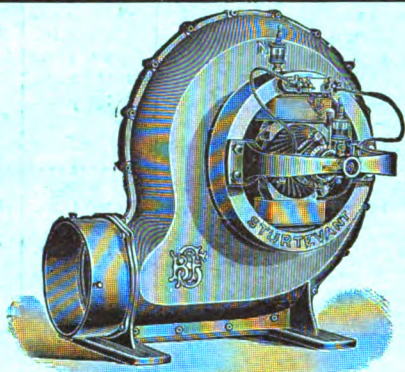
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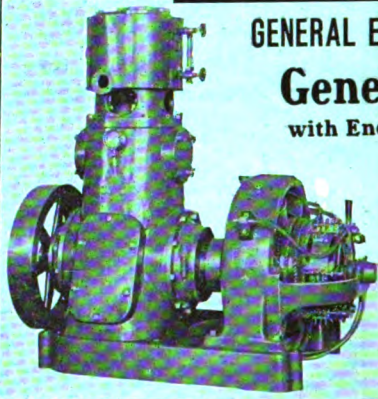
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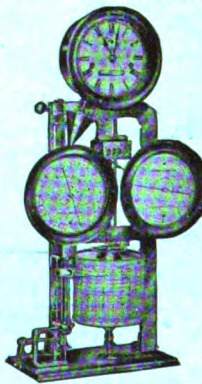
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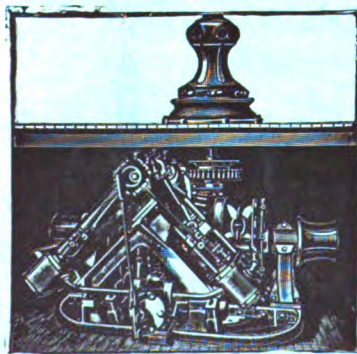


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